BEST MBAS

Think Stanford or MIT is tops in techno-MBAs? Our survey (page 56) ranked these first:

1. NORTHEASTERN UNIVERSITY

2. UNIVERSITY OF TEXAS, AUSTIN

3. UNIVERSITY OF MARYLAND

COMPUTERWORLD

THE NEWSPAPER FOR IT LEADERS . WWW.COMPUTERWORLD.COM

SEPTEMBER 27, 1999 * VOL. 33 * NO. 39 * \$4 COPY

COMPAQ DIVERTS TRU64 TO ALPHA

Cancels development on IA-64 to beef up focus on high-performance server lines

BY JAIKUMAR VIJAYAN

Compaq Computer Corp.'s move to stop Tru64 Unix development on Intel Corp.'s upcoming IA-64 chip architecture effectively ends its efforts to make Tru64 Unix a mass-

ROLLING OUT The Web Carpet

Robust sites needed to win holiday shoppers

BY JULIA KING

Total sales: \$14.9B

SOURCE JUPITER COMMU-NICATIONS LLC NEW YORK

Online holiday sales are expected to hit \$6 billion this year, with some 10 million

first-time cyber-shoppers clicking Web-based buy buttons, according to new research from New York-based Jupiter Communications LLC.

But there's a

But there's a catch: First-time online shoppers who are disappointed by Web site outages, or-

der fulfillment snafus and other hassles likely won't be back,

Web Carpet, page 105

volume operating system.

The move once again underscores Compaq's continuing struggle to spell out a consistent plan for its acquired technologies. But it could actually result in a sharper focus on Tru64 Unix at the high end, said users and analysts.

Compaq Senior Vice President Tim Yeaton last week said Compaq will discontinue all Tru64 product development on IA-64 and focus instead on

Tru64 for the Alpha platform.

"This is designed to clarify and strengthen our focus" on delivering separate lines of high-performance servers and those based on commodity Intel technology, Yeaton said. At the high end, Compaq will have Alpha-based servers running Tandem's NonStop Kernel operating system, Tru64 Unix and OpenVMS. Linux-based servers will fill out the low end.

On the Intel side, Compaq will offer Windows NT, Novell Inc.'s NetWare, Linux and The Santa Cruz Operation Inc.'s Tru64, page 16

"This is the third [decimal-

ization] conference I've been

to, and I still can't get an an-

swer" on key details, such as

whether the Securities and Ex-

change Commission is going to

MICHAEL LEACH, INFORMATION SECURITY MANAGER AT DU PONT, says the company has occasionally put too much information on the Web but now has a secure extranet

SINFT MACNET

OUR WEB SITE MAY BE drawing spies.

In the craze to put everything on the Web, some companies are giving away too much information — to competitors. Gary H. Anthes reports

that competitive intelligence professionals are searching corporate Web sites right now to get juicy nuggets about products, pricing, strategic alliances and ways to steal employees. One company provided an employee directory that was a virtual shopping guide for headhunters. It's time to weigh the business benefits of Web pages against the risks.

Report begins on page 62.

DECIMALIZATION OR DECIMATION?

Wall Street pros groan about project overload

BY THOMAS HOFFMAN NEW YORK

They already are facing sameday trade settlement, Y2K and a slew of other major projects. Now Wall Street IT professionals are grimacing at the prospect of revamping their core trading systems to price stocks in decimals instead of fractions within the next 10 months.

A one-day conference held here last week to discuss the price shift was filled with tension and acrimonious comments. FALLING PRICES KEEP PCs ON TOP

PC sales to tower over crop of new thin clients

BY MATT HAMBLEN AND STACY COLLETT

Rumors of the desktop PC's demise have been greatly exaggerated.

In fact, full-functioning desktops with fast processors and plenty of applications, hard drives and CD and disk bays will have a solid place in corporations for a long time to come. This is true despite new models of thin clients and net-







thinkpad.nt leverage

ThinkPad*

with Windows NT°

from \$2,699 up to 14.1gb hdd / up to 128mb memory up to 14.1° display

@business tools

mobile Pentium® II processor up to 400mhz When does a very powerful notebook become even more powerful? When you put Windows NT Workstation on an IBM ThinkPad. Windows NT Workstation 4.0 gives you 30% more speed than Windows® 95. And three times the reliability. You get the usual Windows ease of use. And of course on a ThinkPad, all that ThinkPad goodness. www.ibm.com/thinkpad or 800 426 7255, code tp200



KITCHEN E-MAIL?

You've heard of the Web appliances – now some vendors are Web-enabling everything from refrigerators to gas pumps. If this takes off, IT leaders will have to develop a whole new class of applications and keep them running. Page 90



BLACK MONDAY

Back in 1987, the reason for the crash had everyone perplexed, but in the end, part of the blame fell on computers. Flashback, Page 92

COMPUTERWORLDTHISWEEK

NEWS

- 4
- 4 NASDAQ ROLLS OUT faster intranet to let members trade twice as much, twice as fast.
- 6 SENATE PREDICTS inconveniences but no major U.S. disasters following Y2K; overseas, it's a different story.
- 8 ANTITRUST ARGUMENTS
 close in Microsoft case; Judge
 Jackson remains stone-faced
 about ultimate decision.
- 10 FTC CRACKS DOWN on porn sites "pagejacking" legitimate gaming and e-commerce sites.
- 12 MICROSOFT ROLLS OUT
 Digital Dashboard knowledge
 management suite; users
 call it demoware.
- employers to read staff e-mail, but products proliferate to make it easy.

OPINION

- 33 NEW ECONOMY? Bah!
 Change is continual, and
 focusing on newness ignores
 the need to work on solid business issues, David Moschella
 warns.
- 36 IT MUST CALM users about Y2K, or millennial panic will be the millenial problem, Kevin Fogarty predicts.

BUSINESS

- 41 BANK LURES kids into longterm customer relationship with ATMs geared toward needs like planning toy purchases.
- 42 HOTEL IMPROVES reservations revenue, capacity after reluctant upgrade but keeps old apps online.
- **47 IT MANAGERS** confident in latest Y2K survey.
- 49 FLOYD FORCED data center into disaster recovery plan, which worked despite the odds.
- **52 DOT.COM COMPANIES** are overvalued, but they show IT shops how horizontal integration can help established businesses, Jim Champy writes.
- 56 TOP TECHNO-MBA

 programs aren't the ones you'd
 expect; lower-profile schools
 keep the focus on results.
- 57 HYPE SURROUNDS

 Techno-MBAs, but those with the right skills mix really justify the high salaries.
- 62 "USEFUL" WEB SITES can help customers, or give away your plans to competitors.
- 64 AFFINITY MARKETING improves e-business by helping you focus on on only the best prospects. Business QuickStudy.
- ****BEST EFFORT"** requirements in contracts often let vendors get away with the best *they* think they should do, not what you need, Joe Auer warns.

TECHNOLOGY

69

- 71 SAP WILL SHIP the first of its customer-relationship management applications by the end of the month.
- 76 PC VENDORS JUMP into the thin-client market with new hardware that boasts wider operating system support and lower prices than previous models.
- 77 DON'T BLAME Back Orifice for the nasty things people do with it, argues security consultant Bruce Schneier.
- 77 GIGABIT ETHERNET
 topped the agenda at Networld/Interop, showing how
 big a pipe you can make out of
 copper.
- **82 B-TO-B COMMERCE** software keeps corporate purchasing fast and records straight.
- **84 ERGONOMIC** accessories offer a comfortable workspace if you pick right ones.

86 WHAT, YOU DON'T HAVE

your own domain name yet?
We explain what they are, what they do and how to get one.

FIELD REPORT

88 SPEECH-RECOGNITION software is improving, but it's still not where it should be.

SKILLS SCOPE

93 THE MONEY'S GOOD and the work's still there, but some PowerBuilder programmers are starting to look to Java, C++ and Web development.

67

ONCE YOU'VE
ADOPTED A
TECHNOLOGY
AND PAID THE
HORRIBLE
PRICE OF
ASSIMILATING
IT INTO YOUR
CULTURE,
YOU DON'T
WANT TO
GIVE UP ON IT
UNTIL YOU
ABSOLUTELY
HAVE TO.

STEVE MEDINA,
CARLSON HOSPITALITY WORLDWIDE,
WHICH PROFITABLY USED AN ANCIENT
RESERVATION SYSTEM UNTIL RECENTLY,
WHEN CAPACITY ISSUES FORCED AN
UPGRADE. IT KEPT THE OLD SYSTEM
ONLINE AS A BACKUP. SEE PAGE 42.

Senator Lambastes Utility Y2K Laggards

U.S. Senate Y2K Committee Chairman Robert Bennett, R-Utah, last week said a prolonged nationwide blackout will almost certainly not occur because of the Y2K efforts by the nation's 250 bulk power producers. But he also noted that 75% of the country's electric utilities don't routinely share their Y2K information, and he wants laggards publicly exposed.

SEC Chairman Urges Centralization

Arthur Levitt, chairman of the Securities and Exchange Commission, last week urged traditional stock exchanges to join forces with alternative trading networks such as Instinet Corp. to create a centralized electronic market. At Columbia University last week, Levitt called on stock markets to make it easier for electronic communication networks to access the system used by the New York Stock Exchange to link their stock prices.

IBM Launches Desk-Side Mainframes

IBM last week introduced the Multiprise 3000, a low-end mainframeclass server family featuring three desk-side models with prepackaged software. A new usage-based software pricing model was designed to let users increase hardware capacity without always having to pay associated software charges.

Short Takes

The first beta version of SUN MI-**CROSYSTEMS INC.'s Solaris 8 Unix** operating system shipped Friday. The company said it would release the beta version of Java 2 Platform, Enterprise Edition this week. . . . SECURITY FIRST TECHNOLOGIES said Friday it would acquire VER-FICALONE CORP. for about \$166 million in stock to integrate VerticalOne's technology into its Internet applications for financial institutions. . . . California Gov. Gray Davis last week signed into law a bill that lets contracts with electronic signatures count as legal documents.

Saks Seeks Supply-Chain Efficiency, More Control

Fashion retailer, like other store chains, looking to IT to beef up supplier data links

BY DAVID ORENSTEIN

IKE MANY of the retailers gathering this week in Philadelphia for the National Retail Federation's Supply Chain Management conference, much of Saks Inc.'s supply-chain potential lies ahead.

Between 80% and 90% of Saks' merchandise is individually tagged by suppliers and shipped in bar-code-labeled cartons, said Saks CIO Dan Smith. The labels match electronic packing lists, allowing the goods to whisk through distribution centers without the

need for constant inspections. But some of Saks' 12,000 suppliers are unable to present all the data the \$6 billion Birmingham, Ala.-based retailer needs. In about 25 to 30% of those cases the problems substantially hinder Saks' ability to process their goods, Smith said.

The information differences between vendors and Saks will require more tools before data can be reconciled, Smith said. To that end, Saks last week purchased software that will increase its emphasis on private-label merchandise and potentially give it greater control over its supply chain.

The product, RockBlocks from RockPort Trade Systems | Inc. in Boston. Difficulty bring-

Inc. in Gloucester, Mass., provides components retailers can manage the myriad of events and documents involved in contracting with overseas factories to produce and deliver merchandise.

Because RockPort package's components Web-based, many small vendors overseas may be able to

work with it even though they can't work with more difficult electronic data interchange or | dise to its customers' tastes.

packaged systems, said analyst Greg Girard at AMR Research

JUST THE FACTS

Saks' Story

Headquarters: Birmingham,

1999 revenue: \$6.2B

Number of stores: More

What they did: Bought a

supply-chain management

package called RockBlocks

to manage the production,

export and distribution of

private label merchandise

ing vendors up technological speed has hindered retailers' supplychain management efforts. Girard said many top retailers have electronic interactions with only a quarter of their supply-chain partners.

In addition to information technology benefits, by commissioning more of its

own goods, Smith said Saks hopes to tailor more merchan-

Nasdaq Connects Faster-Trading Extranet

\$600M system doubles speed and capacity

BY THOMAS HOFFMAN

The Nasdaq Stock Market Inc. last week rolled out an extranet-based trading network for member firms that is twice as fast and can handle twice as many trades as its existing trading system.

The \$600 million TCP/IPbased network, built and maintained by MCI WorldCom Inc., is equipped to handle 4 billion shares of stock per day and could accommodate an 8 billion-share day if necessary. Nasdaq averages 985 million shares per day and reached a peak of

1.4 billion shares in April.

The Enterprise Wide Network II (EWN II) was designed so that it wouldn't have a single point of failure. Each member firm has two "virtual" Tl connections, so that if one connection is taken out for some reason (such as a backhoe cutting into a fiber-optic link), the network can "reheal" itself within 11 seconds without affecting the member firm, said Gregor S. Bailar, executive vice president and CIO at the National Association of Securities Dealers Inc., Nasdaq's

Washington-based parent.

By doubling members' network speeds from 56K bit/sec. connections, Nasdaq and its members are also better positioned to handle a hefty uptick

in traffic when two upcoming projects go live. Those include Nasdaq's plans to add tradematching capabilities from Optimark Technologies Inc. next month, along with Wall Street's shift to decimal-based stock pricing, which will be phased in starting in July (see News, page 1), said Bailar.

E-Bank Upgrades IT for IPOs

BY THOMAS HOFFMAN

Internet investment bank Wit Capital Corp. is making enhancements to its back-end systems that will let it handle up to three times as much customer traffic in a given day.

The New York-based bank, founded by lawyer and microbrewer Andrew Klein in 1996, has been cashing in on the Internet IPO boom. At the end of last year, Wit had 16,000 customers. By June 30, that number had shot up to 66,800.

Even though the bank has previously handled up to three IPOs on a given day, the laborintensive process of notifying and confirming orders with clients often meant that Wit's employees would have to work around the clock, said Senior Vice President Susan Berk-

Wit has hired Business Data Services Inc., a Glastonbury, Conn.-based systems developer, to enhance its distribution architecture, said George Lieberman, Wit's CIO.

The first enhancements, to be done in two months, will let Wit handle three or four IPOs per day and up to three times as much customer traffic, said Lieberman. He declined to say how much Wit was spending on the project.

Business Data Services is bolstering Wit's systems with Microsoft Corp.'s Windows NT and IBM RS/6000 servers that can operate simultaneously, supported by an Oracle Corp. back-end database.

Corrections

This week's Business section feature on Computerworld's Techno-MBA survey has incorrect URLs for several schools' Web sites in the chart or page 58. A corrected chart is available online at www.computerworld. com/home/print.nsf/all/990927c35a.

In a Sept. 20 Technology section story ["User Shows Get a High Five," page 89], the Oracle Applications User Group (OAUG) was incorrectly identified as the organizer of Oracle Open World, Oracle Corp. runs Oracle Open World. OAUG is an independent user group with its own conference.

A Sept. 6 Technology Flashback feature ["Mac Makes Its Mark," page 76] misspelled Jef Raskin's name.



IS YOUR BACKUP TOUGH ENOUGH FOR THE JOB?

Is your critical data guarded by a puny backup system that doesn't easily scale up? Backup Express™ is a powerful enterprise-wide backup/restore solution designed for today's distributed networks. Backup Express backs up and restores gigabytes of data fast — whether

on UNIX, Windows NT®, or NetWare. Visit www.syncsort.com/99CWB to arrange a free trial or for a free copy of Easy Tape Handling for Automated Libraries.



Tel (201) 930-8200 dept. 99CWB www.syncsort.com/99CWB

Y2K Report May Be Too Late to Be Useful

Senate panel's wrap-up warns of slowdown

BY PATRICK THIBODEAU

HE U.S. SENATE'S Special Committee on the Year 2000 Problem last week issued its final report, which predicts short-lived failures and inconveniences domestically no major disasters. More ominously, the Senate said Y2K problems overseas could increase gas prices, disrupt foreign supply chains and trigger a general economic slowdown.

But for corporate information technology managers, the 288-page report may be too late to be of much help.

"The report would have been much more valuable two years ago," said Matt Saikkonen, CIO at Consolidated Freightways Corp., a Menlo Park, Calif.-based transportation company with 22,000 employees. "For those companies that do find issues [in the report], there is very little time to act," he said.

Consolidated Freightways is

reviewing the Senate's report to "see if there is anything we missed" and to validate its own Y2K preparation efforts, Saikkonen said. But he said his company has been "well ahead" of the Senate committee reports, which largely relied on industry readiness assessments.

Kazim Isfahani, an analyst at Giga Information Group Inc. in Cambridge, Mass., said the Senate report is no substitute for firsthand, one-to-one meetings with key suppliers. The report "is by no means a decision-making tool," he said.

The Senate's strongest words

of caution concern the economy. Global Y2K problems could affect the U.S. economy much like last year's Asian

AT A GLANCE

The Senate's special

Y2K committe's final

2000 problem is avail-

able at www.senate.

gov/~y2k/documents/

100dayrpt/

report on the year

Asian Flu, which forced many companies to cut earnings estimates.

Most overseas Y2K projects outside of Western Europe are lagging, the report said, and Italy has fallen behind its European neighbors.

The report echoes Federal Reserve Board Chairman Alan Greenspan's warning this month that Y2K could produce economic bottlenecks if many businesses move now to build their inventories. The key is to avoid "fear-induced" responses to Y2K, he said.

Andrew Zimbalist, a profes-

sor of economics at Smith College in Northampton, Mass., agreed. "I don't think the Y2K phenomenon itself is going to monetary crisis, the so-called | cause a problem.... I think it's

> the way people are anticipating and reacting" to it, he said.

The Senate committee, however, is at odds with the U.S. Department of Energy (DOE) on oil and gas supplies. The com-

mittee expects that some Y2Kinduced disruption in the flow of imported oil may be significant enough to affect gas prices.

The DOE reported that oilsupply problems in one country could be offset by another country. In any case, the U.S. has a two- to three-month strategic reserve.

Wells Fargo to Build Web Sites

Service caters to small, midsize firms

BY JULIA KING

Wells Fargo & Co. is already in the office supplies business. Now the \$205 billion, San Francisco-based financial services

company is getting into building Web sites as well.

Last week, Wells Fargo announced a partnership with Atlanta-based First Data Corp. to sell a service that lets small and midsize businesses build online stores.

The new One-Stop eStore gives users access to

Web-based tools to create a storefront, build a catalog of products and services and accept online payments from customers. Wells Fargo is offering the service for free through Nov. 15. After that, there will be a \$200 installation charge and a monthly Web hosting fee of \$45.

"It's really a strategy focused on customer retention," said Michelle Banaugh, senior vice president of e-commerce at Wells Fargo.

When Wells Fargo began processing credit-card payments for online transactions in 1995, many of its small-business customers asked the bank to recommend companies that could build Web sites. Most small companies found the task too complex and timeconsuming to do in-house.

WELLS FARGO'S Michelle Banaugh: Strategy is all about "customer retention"

In August, Wells Fargo cited similar reasons for launching an online office supplies procurement service for its business customers [News, Aug. 9]. The bank later surveyed 800 small and midsize business customers and found that 60% would consider buying a turnkey

e-commerce service from Wells Fargo with both creditcard processing and Web site services, Banaugh said.

Among those who expressed interest was Bonnie Rubin, vice president at John's Natural Dog Training Co. in Escondido, Calif. "I already had a Web site for a couple of years, and it does fairly well, but it takes a lot of my time," Rubin said. Each time she needed to make changes to the site, such as adding product offerings or

posting special promotions, Rubin had to hire a skilled programmer or webmaster at a rate of \$50 to \$100 per hour.

Now Rubin dials in to the Wells Fargo site, enters a password and makes the changes herself, using a series of templates and simple guidelines, she said. As for cost, "I'm not going to see a lot of savings ini-

cost is about the same as it was before [with a different Web hosting provider]. But what I will save on is not having to pay a programmer to go in and make changes. I'll be able to do them myself," she said.

Wells Fargo is timing the service to help online stores launch their sites in time for the holidays. But even with a tially [because] the hosting | six-week head start, some analysts remain skeptical about how well such small retailers will fare online.

"The biggest issue that these companies face is the proliferation of sites coming online in the last quarter with little opportunity to promote themselves or differentiate themselves," said David Schatsky, an analyst at Jupiter Communications LLC in New York.

Chip Plants Not Hit Directly in Taiwan Quake

Supplies could see several-week delay

BY STEWART DECK

The powerful earthquake that rocked Taiwan last week won't cause major problems for the computer industry, observers

The temblor, which hit 7.6 on the Richter scale and killed more than 2,000 people, reportedly didn't do direct damage to the computerrelated manufacturers there but may still cause a severalweek disruption in supplies because of damage to the island's infrastructure.

"All of the reports so far from the factories and foundries there say things are fine, but it's just far too early to realistically say what the outcome will be," said Tony Massimini, an analyst at Semico Research Corp. in Phoenix.

The earthquake may have caused more troubles in the form of transportation interruptions and workforce upheaval than in manufacturing facility damage. If plants are unreachable because of destroyed roads and people are unable to return to work, the industry will see long-term shortages, according to a news bulletin from Merrill Lynch & Co.'s global semiconductor analyst team.

In addition, electric power has been disrupted, forcing many plants to shut down. Once power is fully restored, plant managers will need to check the safety of facilities and recalibrate manufacturing tools, analysts said.

Roger Kay, an analyst at

International Data Corp. in Framingham, Mass., said it's still too early to know the full impact of the earthquake. But he added that the shipments of chips used for motherboards and flat panels used in PCs and laptops would certainly be slowed because several makers begin their production at plants in Taiwan.

This isn't the first time an earthquake has hit a chipmaking area. In 1989, Silicon Valley was hit by a large quake, and Kobe, Japan, was struck by a sizable quake in 1995.

"The industry takes this type of thing somewhat into account," said Massimini. Most companies locate plants in multiple countries, in part, because of the natural disasters and political upheaval possible throughout the world,

The Fastest Way To Make E-Commerce A Reality.



©1999 Computer Associates International, Inc., Islandia, NY 11749. All product names referenced herein are trademarks of their respective companies

Everybody's talking about making money on the Internet, but who's actually doing it?

Our clients.

Every day they're using the Internet to take orders, ship materials, market products, sell prospects, you name it. Every day they open their doors to millions of new customers they could never reach before.

You can do it too—much faster than you ever dreamed possible—guaranteed.

The key is our ability to integrate legacy applications faster than anyone else. We can extend legacy applications for e-commerce instantly. And when it comes to support, we support more mission-critical, e-commerce applications than anyone.

So stop talking about e-commerce and start doing it. Call us today to learn how we can help you get to the e-market faster, faster, faster.

For a FREE e-commerce assessment, call 1-877-462-2477 or visit our website at www.cai.com/gps.



Global Professional Services

Accelerated Delivery. Guaranteed.



BRIEFS

E-Tax Exemption Bid

U.S. Senate Commerce Committee Chairman John McCain has introduced legislation that would make the Internet tax moratorium permanent. The current three-year tax moratorium, which stopped states from imposing any new Internet-related taxes, isn't set to expire until October 2001.

EarthLink Merger

Internet access providers EarthLink Network Inc. and Atlanta-based MindSpring Enterprises Inc. will merge in a stock swap deal that will create the nation's second-largest provider of Internet access, with more than 3 million members. The new company, with combined revenue of \$600 million, will be known as EarthLink and based in Atlanta.

U.S. Invests in Cray

Silicon Graphics Inc. last week said several U.S. government agencies, including the National Security Agency (NSA), have committed to provide the Mountain View, Califbased vendor with "significant" financial support for development of the next version of the Cray highend supercomputer line. An NSA scientist said SGI's Cray machines "are absolutely essential to U.S. national security interests."

Win2K Datacenter Server Tests to Begin

This week, some 300 large companies will begin testing Microsoft Corp.'s fourth and final segment of Windows 2000, the Datacenter Server, which is expected to ship next year.

Secure IBM PCs

IBM announced a new line of secure PCs with embedded security chips, smart-card access and encryption. The new IBM Client Security Solutions family also offers key encryption and digital signatures for authentication and user identification. The IBM PC 300 PL costs \$1,349 and the IBM PC 300 GL costs \$1,019. Both will be available at the end of next month.

It's Decision Time in Microsoft Antitrust Suit

Closing arguments have been heard, but the case remains a remote affair for users

BY PATRICK THIBODEAU

OTH SIDES in the Microsoft Corp. antitrust trial completed closing arguments last week before an uncharacteristically silent and stone-faced Judge Thomas Penfield Jackson. He offered no clue about how he may decide the landmark case.

Jackson's first key opinion could arrive as early as next month, with a final verdict possible before year's end. But unless his verdict sparks new settlement talks, appeals may keep this case unresolved for many years to come.

For corporate users, the nearly year-long trial has been far removed from their daily decision-making. And some can't see how any court remedy will change their environments and increase competition.

"None of what I've seen proposed seems to fix the problem," said Norman Raphael, technical support manager at Jamesbury Inc., a valve manufacturer in Worcester, Mass.

He said Microsoft's Windows is "the platform of choice," but "I don't know how you dislodge them." Still, Raphael said he doesn't believe Microsoft's actions have warranted the government's lawsuit.

Others say the competition is already there, but so far no company has been able to best Microsoft.

"Has anybody been smart enough to outsmart Bill Gates? Not yet," said Donna Rosentrater, a senior information technology manager at Pacific Scientific Co. in Wilmington, Mass. But she said she doesn't doubt that another Gates will one day arrive.

A Call for Restructuring

If Jackson decides in favor of the government, federal and state attorneys will likely argue for a breakup of the company. Stephen Houck, the lead attorney for the 19 states in the lawsuit, used his closing argument to call for a market restructuring.

"If the market remains structured as it currently is, Microsoft will retain both the means and the incentive to do what it's done for many years now: to restrict consumer choices, to raise prices and to stifle innovation," Houck said.

Microsoft attorney John Warden argued that the company faces tremendous competition and the government was acting at the behest of some of its major competitors, such as Sun Microsystems Inc. and IBM.

"Even monopolists are supposed to compete hard to win all of the business if they can and such competition plainly benefits consumers," Warden said.

Jackson will have to decide if Microsoft is a monopoly that also squashed competition to keep that power. Most legal experts agree that the government never produced a "smoking gun" — clear proof that Microsoft illegally attacked competitors — but instead used a large, cumulative body of evidence to suggest an ongoing pattern of wrongdoing.

Government chief trial attorney David Boies said the clearest insight into Microsoft's "soul" was the infamous June 21, 1995, meeting at Netscape Communications Corp., where Microsoft allegedly tried to divide the browser market.

Boies spent considerable time reviewing the evidence of that meeting, but Warden questioned it, accusing a Netscape official of "ginning" a key account of the meeting.

Closing Arguments

Excerpts from the Microsoft antitrust case:

"Microsoft is like the emperor without clothes. No matter how long or how loudly Microsoft proclaims it lacks monopoly power, everyone, including Microsoft, knows it's a monopoly." - Stephen Houck, New York State attorney and lead attorney for 19 states

"The Sherman [Antitrust] Act is not a TV game show, where once you win a prize you have to give up your seat to another contestant.... And you not only keep on playing, you get to keep on winning until somebody smarter beats you." - John Warden, Microsoft's chief trial counsel

Online, Microsoft to Focus on Services

Consumers, small business are up first

BY DAVID ORENSTEIN SEATTLE

Moving away from efforts to become a huge Internet content provider, Microsoft Corp. last week unveiled a road map of Web-based services that analysts said herald a sharpened focus on the company's core strengths of providing software tools and services.

Although Microsoft President Steve Ballmer suggested that Microsoft would eventually provide Web services to en-

terprise IT customers, most of the company's initial push will be in the consumer and small business space. "This is the first place we get to pioneer our new platform," Ballmer said.

Services Platform

The "new platform" involves several online technology services designed to make the Web more directly useful to consumers and small businesses, officials said.

As for enterprises, Ballmer said Microsoft isn't yet ready to discuss in detail the planned services, such as providing Web-based versions of Office and Exchange or eventual

revisions to Windows 2000.

Ballmer said Office will become available online "sooner than you'd expect," while the revisions to Windows, designed to require less code on client machines, will take years to be fully realized.

Companies pursuing business-to-consumer e-commerce strategies will have to weigh whether to bet on Microsoft's offerings. Analysts said many will, especially now that Microsoft is no longer bent on charging into the e-commerce businesses for itself.

Neil J. Herman, an analyst at Salomon Smith Barney in New York, said Microsoft is better off focusing on its software roots than "in trying to be everything to everyone." Microsoft can continue the dominance of its core software such as Windows and Visual Studio application development tools, he said, by engaging Web content providers and e-commerce companies rather than competing with them.

As part of its effort to divest its online content and media responsibilities, the company said it will spin off its Expedia travel site in an initial public offering. Microsoft will retain a majority stake.

The spin-off follows an announcement that Microsoft will partner with Ford Motor Co. to drive the formerly all-Microsoft CarPoint car buying site (see story, page 20).

We'll take care of the e.

You take care of the business.

When you host your Web applications with GTE Internetworking, you'll have more time to focus on what matters most: your business. That's because you'll have an industry-leading team of e-business consultants and Web architects, who will take care of all the technology details for you. Working in partnership with you and your IT staff, and drawing on the strength of our world-class e-business infrastructure, our seasoned professionals deliver secure, reliable solutions that will grow as your business grows. Find out more about how hosting with GTE Internetworking lets you spend your time the best way of all — doing what you do best. Call 1-800-847-0172 today or visit us at internetworking.gte.com/hosting.

Enterprise Hosting. Enabling e-business.



INTERNETWORKING
POWERED BY BBN

Find out more about Enterprise Hosting with GTE Internetworking and you could win a trip to Boston to attend Forrester's Executive Strategy Forum "Beyond E-Commerce: Winning in the Internet Economy."

No purchase
necessary to enter or
win. All entries must be
received by October 14, 1999.
Must be 18 years or older to
enter. For official rules, send your
name and return address to
3 Van de Graaff Drive,
P.O. Box 3073, 6/0 Official
Rules, Burlington, MA
01803.

FTC Cracks Down on Web 'Pagejacking'

888.737.7271 ext. 4470

Spesal IRR and Fina a

Search AltaVista for computer game Web sites and you will find a link to a top 10 gaming | link that claimed to be Adren-

site called Adrenaline Vault. Six months ago, though, consumers might have gotten a

aline Vault but actually redirected them to a sexually explicit site.

The Federal Trade Commis-

sion (FTC) last week began to crack down on the scam, which can harm a business site's reputation and revenue as upset consumers find pornography instead of the intended site.

The FTC said last week that it obtained a preliminary injunction against a Portuguese hacker and an Australian company to stop the practice known as "pagejacking."

The scammers cloned popular Web sites in a scheme that affected at least 25 million pages, the agency charged in its civil suit.

Those copies included a legitimate site's metatag - an identifier that helps search engines categorize pages — as well as a command automatically redirecting surfers from the copied sites to the porn sites, the FTC said.

Angel Munoz, president of Dallas-based NewWorld.com Inc., the parent company of Adrenaline Vault, sought the FTC's help several months ago after alerting AltaVista Co. and the FBI in May that consumers were reaching lurid sexual images instead of his games site.

Munoz said at least 3 million unique users access Adrenaline Vault each month, and about one-third of them are 19 or younger.

"The worst part about it is that somebody not familiar with our site will [come to] Ad Vault and see a porn site. I have young children and don't want my young children to search for games [and find pornography]," said Munoz, who added that he doesn't know how long his Web site was allegedly hijacked.

The Bottom Line

In addition to affecting his company's image, the incident also put a crimp in revenue, Munoz said.

About 15% of his customers reach the site via a search engine, and Adrenaline Vault can lose thousands of dollars each day that people can't access the site, he said. "We can't quantify how many people were victims of this and never made it to our site."

Abner Germanow, a security analyst at Framingham, Mass.based International Data Corp., said the only way corporate webmasters can deal with such scams is to closely monitor access to their sites and alert authorities and search engine companies of any suspicious findings.

"To protect your intellectual property, it's always wise to watch how [your company] shows up in search engines," Germanow said.



www.resourcepartner.com



How can my business race ahead on the 8-way highway?

The Compaq ProLiant 8000 and 8500 servers have redefined industry-standard technology, yet again. With its revolutionary new 8-way scalable architecture, Compaq brings enterprise customers a new generation of powerful ProLiant servers. They deliver breakthrough scalability, higher levels of

xeon.

reliability and unbeatable price performance for NonStop® e-Business Solutions. They're backed with business-critical Compaq services, tailored to your needs. And, since Compaq co-developed the crucial ProFusion® 8-way architecture with Intel® no one knows it better. For all the powerful advantages of the 8-way revolution—breakthrough performance, scalability and reliability—there's just one road to take. Details? Visit www.compaq.com/8-way, or call 1-800-AT-COMPAQ.

COMPAQ Better answers.^{5M}

'Dashboard' Not Fully Lit

Users skeptical of Microsoft portal concept

BY DOMINIQUE DECKMYN

IGITAL Dashboard, Microsoft Corp.'s concept of a personal portal built on Microsoft Outlook, Exchange and SQL Server, is meeting skepticism from users and analysts. But independent software vendors and integrators are cheering that it is not an out-of-the-box application.

Microsoft introduced the Digital Dashboard in May as a personal portal that would run inside Microsoft Outlook. Last week, Microsoft announced the availability of a Digital Dashboard Starter Kit, a set of software tools designed to help Internet service providers and corporations design Digital Dashboards. And on Wednesday, at the Knowledge Management World '99 show in Dallas, Microsoft demonstrated a Digital Dashboard developed for Texaco Inc. that will be rolled out to 50,000 users.

"It seems they are taking existing tools that weren't designed for this and piecing them together rather than designing something new," said JUST THE FACTS

Texaco's Dashboard

Microsoft demonstrated a Digital Dashboard for Texaco:

- To be rolled out to 50,000 users, organized in 12,000 teams
- Client built in Outlook 2000, connecting to Exchange 5.5
- Other components: Microsoft Office 2000, Microsoft NetMeeting

Peter Nies, manager of knowledge management information technology at Raytheon Systems Co. in Dallas. "Knowing Microsoft, they will probably evolve this into a decent product, but I don't see it yet."

Microsoft said users ultimately will create portals to give others access to Outlook and Microsoft Office documents. However, David Coleman, managing director at Collaborative Strategies LLC, a San Francisco-based research firm, said a Microsoft-only approach to collaboration risks cutting off users. "Not everyone does everything in [Microsoft's] environment," he said.

Users are taking a wait-and-

see attitude. "I think it has promise, but I need to see more real live [Digital Dashboards] rather than demos," said John Callahan, director of knowledge management at Deloitte Consulting, a division of New York-based Deloitte Touche Tohmatsu. Deloitte is moving

to Outlook 2000 as a messaging client, which means users will have Outlook open. This might make an interesting platform for a portal, he said.

Analysts point at some holes in Microsoft's offerings. David Yockelson, senior vice president at Meta Group Inc. in Stamford, Conn., said that to build a complete enterprise portal, features like indexing, search capabilities and personalization must be added.

The holes open opportunities for developers. "We like that [Microsoft has] gone with a broad horizontal concept and leaves the vertical products to [independent software vendors]," said Douglas Gilbert, a director at Cogos Consulting Inc. in Cambridge Mass. D

Oracle to Extend Support For Green Screen Past 2000

ERP users need time for Web upgrade

BY CRAIG STEDMAN

For Oracle Corp., closing the books on its green-screen ERP applications is proving harder than expected.

Oracle this week will give its independent applications user group the full story about the next upgrade of its Web-based enterprise resource planning (ERP) software, due in February. That's five months behind the schedule Oracle officials laid out last spring.

But at the Oracle Applications Users Group's (OAUG) fall conference in Orlando, Oracle will also announce plans to extend support for the character-mode applications that many users still run — a move requested by the OAUG's board of directors in July.

Oracle had planned to stop updating the character-mode software with bug fixes at the end of next year. But Oracle officials last week confirmed that support will continue into 2001, although they said the length of the extension was still being finalized.

Several users applauded the change. Having just finished upgrades to Oracle's only year 2000-compatible green-screen release, users said they don't relish the idea of pulling off another upgrade — to its Webbased software — next year.

"There was just no way we would have been able to do it by then," said Hugh Allan, director of information technology at Acme Electric Co. in East Aurora, N.Y. "We would have had to go into a mode where [Oracle] wouldn't give us new bug fixes."

Allan said Acme, a maker of electrical devices such as power converters, has to buy new Unix servers and beef up about half of its 400 PCs before it can install the applications. And switching to Oracle's graphical user interface poses "an enormous training issue," he added.

Don Payne, executive vice

JUST THE FACTS

Upgrading Oracle

The change: Oracle stopped developing its character-mode ERP applications two releases ago and wants to end technical support for them. That means users have to upgrade to newer releases that run on Web browsers tied to application servers.

The problem: Many users just finished upgrading to the last character-mode release to make their systems Y2K-compatible. Doing another upgrade to Oracle's new three-tier Web architecture doesn't appeal to them.

president of the OAUG board, said the group asked — at a regular quarterly meeting with Oracle executives two months ago — that support for the character-mode applications be extended into late 2001.

"We believe users need some breathing room," said Payne, director of information systems at Integrated Measurement Systems Inc., a Beaverton, Ore., maker of equipment used to test semiconductors.

The delayed shipment of the Release Ili upgrade is a factor, Payne added: Many users want to skip over Oracle's first Web-only ERP release and go directly to Ili, but doing that by the end of next year would be tough if the software isn't available until February.

Draeger Safety Inc., a Pittsburgh-based maker of breathalyzer devices and gas-detection equipment, doesn't plan to go right to lli. But upgrading its character-mode system to Oracle's current Web-based software may take into early 2001, said Shirley Jessup, Draeger's Oracle applications manager.

Jessup said Draeger had to put off other projects to upgrade to the Y2K-compatible release of Oracle's applications earlier this year.

IBM Improves Web Tools

Data analysis products included

BY STEWART DECK AND CAROL SLIWA

IBM last week made several e-commerce-related announcements geared to help customers gather and analyze business data and build and manage Web applications.

IBM updated Intelligent Miner 6.1 for data mining and DB2 OLAP Server 1.1 for online analytical processing (OLAP) and will provide access to NCR Corp.'s Teradata database through its DB2 DataJoiner 2.1.1. DB2 Intelligent Miner 6.1 has more data visualization features, and the DB2

OLAP Server 1.1 adds simpler query language.

But the link between these tools and e-commerce is still not complete, said Frank Gillett, an analyst at Forrester Research Inc. in Cambridge, Mass. "The enormous quantity of data, the variety of attributes and how to arrange data for meaningful analysis are all part of Web data analysis that I don't hear [IBM] talking much about yet," Gillett said.

Also last week, IBM and Austin, Texas-based Vignette Corp. struck a deal under which Vignette will integrate its StoryServer management and personalization software with IBM's Net.Commerce and WebSphere products.

Web Version to Be Released in Steps

Oracle plans a four-step release for the Web-based Release 11i upgrade that will be announced at this week's OAUG conference.

The core ERP applications – financials, manufacturing and human resources – should ship in February, according to Oracle.

That's to be followed by the release of a new order management module in April and an 11i version of Oracle's customer relationship management software later in the second quarter of next year.

By midyear, Oracle plans to add Internet portal-like user interfaces that will be built with an upgrade of its WebDB development tool.

The order management module is supposed to have extended capabilities beyond the order entry software Oracle sells. It was originally due to come with the next version of the applications, but Oracle pulled it forward into 11i.

- Craig Stedman

TECHNOLOGY ALREADY HAVE. GRAND OPENING

NEWS

BRIEFS

Andersen in \$47M Pact

Andersen Consulting has won a seven-year, \$47 million contract to develop a royalty management system for the U.S. Department of the Interior. The project will cover the collection and administration of revenue generated through federal and Indian mineral leases.

Nielsen to Launch Global Net Service

ACNielsen Corp. in Stamford, Conn., and NetRatings Inc., an Internet audience researcher in Milpitas, Calif., said last week they will launch a new global service for tracking audiences, advertising and user activity on the Internet. The idea is to create a global industry standard by which Web site publishers, advertising buyers and marketers can measure traffic on the Internet. The new service will begin tracking Internet audiences by the end of the first quarter next year.

Novell Kills Bug

Novell Inc. has released an updated and debugged version of Support Pack 3 for NetWare 5 to fix a potentially crippling data-loss problem tied to the original support pack. Support Pack 3A can be downloaded from Novell's Web site.

Novell said less than 1% of users of NetWare 5 were affected.

Intuit CEO Resigns

Bill Harris resigned as CEO of Intuit Inc. last week because he and the company agreed that someone with more experience was needed for the company to reach its goal of \$1 billion in sales. Based in Palo Alto, Calif., Intuit makes personal finance software products such as Quicken and TurboTax.

Benefits Outsourced

Best Buy Co. has handed the administrative work involved in providing benefits to former employees to ProBusiness Services Inc. Terms of the deal weren't disclosed. The outsourcer will manage monthly participant reporting and election period processing and assure legislative compliance.

Crypto Policy May Open Back Door

Some fear tough product review will force security vendors to let law enforcers in

BY ANN HARRISON

Proposed changes to the Clinton administration's encryption export policy announced this month are raising questions among civil libertarians and developers about possible government pressure on software companies to build back doors into their products.

Although the new rules would eliminate the current licensing process for the export of strong encryption products, companies would be subjected to a one-time technical review from an as-yet-unrevealed entity.

Barry Steinhardt, associate director of the American Civil Liberties Union, said he believes this will be an opportunity for the FBI and the National Security Agency to strongarm companies into creating security holes in their cryptography products or revealing trade secrets. That would give authorities access to data secured with the companies' products.

"The technical review can be strung out to the point where the industry will be compelled to cooperate with law enforcement or intelli69

Open source doesn't fix the problem, but it lets you manage the risk of using the software. It does take significant time and energy.

> ANDREW FERNANDES, CRYPTONYM CORP.

gence agencies to get their review and put their products on the market," said Steinhardt. "The industry jumped too quickly to embrace this release."

"It's a fair concern," said Jan Janick, vice president of desktop systems development at IBM, which last week announced new commercial PCs with embedded security chips (see briefs, page 8).

Janick said IBM ran its product past the Washington-based Center for Democracy and Technology, a privacy watchdog group, and will disclose information on the system's hardware specifications to show it's not compromised. "We were not planning to provide source code for software, but if it proves to be a critical issue, we will certainly look at it," said Janick.

Support Voiced

One user supported the idea of published specs. "I think it helps everybody in the sense of not keeping things proprietary. It just gives people more confidence," said Pat Heldt, a desktop release manager at Owens Corning in Toledo, Ohio.

Companies should consider products with open source code because reviewers could spot-check the code for back doors, said Andrew Fernandes, a principal at Cryptonym Corp., a security consultancy in Research Triangle Park, N.C.

"Open source doesn't fix the problem, but it lets you manage the risk of using the software. It does take significant time and energy to do," said Fernandes.

Some security software companies, such as Amsterdam-based Trustworks Systems BV, are making open-source products. Trustworks' Oct. 15 release of open-source components will include an Open Crypto application programming interface encryption interface and IPSec component for securing data at the IP level, said Gail James, vice president of marketing at Trustworks.

"We are insisting, to comply with our license, that users not create back doors to weaken security," said James.

The government has until Dec. 15 to codify the encryption recommendations, which then go into effect.

Worker Surveillance Gets Boost, Scrutiny

New product makes it easier; California considers controls

BY ANN HARRISON

As privacy concerns move into the corporate realm, the state of California is considering legislation that would make it illegal for employers to covertly read employee e-mail. Yet some companies are developing products that make it easier than ever for employers to monitor computer use.

The California bill would be an amendment to the state labor code and is expected be signed into law by Gov. Gray Davis before Oct. 10.

Meanwhile, a new software utility called Investigator from WinWhatWhere Corp. in Kennewick, Wash., scans much more than e-mail content. Courts have consistently upheld the rights of employers to monitor activities performed on company machines.

Investigator records all of a user's activity, including the time and date of the action, the workstation, name of the pro-

DID YOU KNOW?

Watching You Work

\$ 63% of employers read workers' e-mail,
by browse their computer files or monitor their
their t

23% of those employers didn't notify their workers that they were being monitored.

gram and title of the activity window. Company president and founder Richard Eaton said Investigator, which can remain hidden from the user, was designed to help system administrators track down software and network problems.

Most commercial monitoring tools scan only e-mail or block access to specific Web sites. However, Investigator, launched last year and recently upgraded, includes a much requested keystroke monitoring feature. "You can make [Investigator] completely silent, so it doesn't show up on a task list. And if they do find it, it can show up ... under another name," said Eaton.

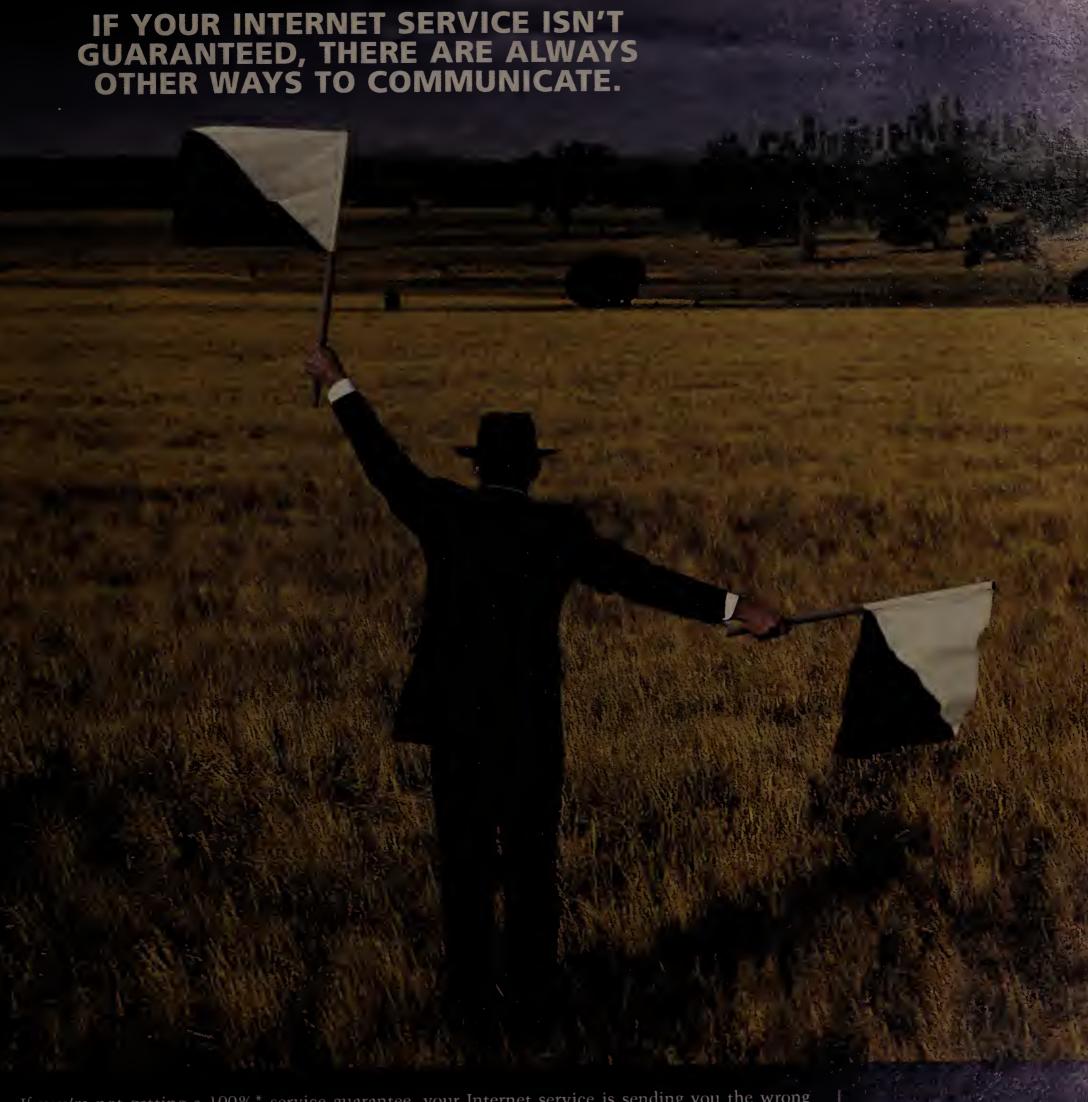
A user who works for an oil company said Investigator lets

his company monitor the activities of security administrators on Windows NT systems. "The security administrators are God on the system, and you can see what they are doing and make sure they are not abusing the trust that you are putting in them," the user said. "The stealth nature of it is an important element because you want to see if the network is at risk."

According to Eaton, other users include Lockheed Martin Corp., Delta Air Lines Inc. and the U.S. State Department. These users declined to say how they use the product.

Eaton said companies make up about 70% of sales, but the product is also used by individuals to monitor such behavior as the activity of spouses and teen-agers in chat rooms.

Beth Givens, director of the San Diego-based Privacy Rights Clearinghouse, said all workplace monitoring should be disclosed except for activities connected with clearly defined criminal investigations. The pending California bill, SB 1016, is the first proposal to codify this requirement.



If you're not getting a 100%* service guarantee, your Internet service is sending you the wrong signal. That's when you need UUNET,® an MCI WorldComs™ Company. Since we understand how important the Internet is to your business, we offer the industry's most comprehensive, yet simple, service level agreement. You'll get guaranteed 100% availability and latency levels on most dedicated Internet connections worldwide. We even guarantee that all new installations are completed quickly and reliably. What's more, we'll proactively monitor your service and let you know promptly if your connection has a problem. So call 1 888 886 3844 or visit us at www.info.uu.net. UUNET. We'll direct your messages to their intended destinations. Guaranteed.



THE WORLD'S INTERNET COMMUNICATION'S COMPANY

Continued from page 1

Tru 64

(SCO) upcoming Monterey Unix, a 64-bit Unix operating system that IBM, Sequent Computer Systems Inc. and SCO are working together to produce.

The news evoked a mixed reaction from users last week. Some said the move would simplify Compaq's enterprise offerings and strengthen its focus on Alpha servers at the high end, while other users called the decision another reversal of Compaq's earlier promises to make technologies it acquired from Tandem Computer Inc. and Digital Equipment Corp. broadly available.

Just last month, Compaq said it won't develop Windows NT for Alpha — after earlier statements of support - because of low user demand. Compaq acquired Alpha and Tru64 Unix when it bought Digital last year [News, Aug.

"The whole pitch they have been giving so far is that you could use an IA-64 server for your [low-end] Unix applications and move right up through the Alpha line for unprecedented scalability," said Tony Ioele, president of the Digital Equipment Computer Users Society.

Disappointing Users

"With this, they are breaking that value chain," Ioele said. "I am not quite sure what they are trying to achieve with this. It is disappointing."

"I am not sure if they are cleaning house or whatever, but sometimes it is a little difficult figuring out which way they are going," agreed Robert Young, an Alpha server user and database consultant at ALI Database Consulting in Aiken, S.C.

"Their past emphasis has been with smaller Intel-based systems. It seems like they still haven't quite meshed that with their high end," Young said.

Others, though, saw the move as a positive development.

"It is disappointing in one sense, but it focuses Alpha on what it does particularly well" at the high end, said Jonathan Eunice, an analyst at Illuminata Inc. in Nashua, N.H.

"It makes sense from my perspective as a Tru64 Unix user on Alpha," said Joseph Pollizzi, deputy head of the science and engineering systems

division at the Space Telescope Science Institute in Baltimore. With SCO already holding a dominant position in the 32-bit Unix-on-Intel market, it's logical for Compaq to also offer SCO Unix as the 64bit Unix of choice on its Intel servers, Pollizzi said.

The move also puts to rest any speculation about where Compaq will spend its future 64-bit Unix development dollars: on Alpha, said Jeff Killeen, president of Information Design & Management Inc. in Hopedale, Mass.

Compaq's efforts to port Tru64 Unix — originally called Digital Unix — to IA-64 was creating some doubt about the level of the company's commitment to Alpha.

"With this, we now know there is no fallback position for Alpha," Killeen said.

On the High End

Compaq's high-performance server plan:

MOVE 'Tandem's Himalaya servers to Alpha technology

INTEGRATE elements of Tandem Non-Stop Kernel technology into Tru64 Unix

MAKE Linux the Alpha massvolume operating system

CONTINUE to enhance OpenVMS

With 26,000 licenses sold last year, Digital Unix/Tru64 Unix accounted for a 3.4% market share in 1998. That was down 21.2% from 33,000 licenses and 4.5% market share in 1997, according to International Data Corp.

Continued from page 1

Decimals

mandate a move to pricing stocks in 10ths, complained one attendee.

A shift to price stocks in nickels (\$0.05) or pennies (\$0.01) is particularly worrisome to information technology executives at firms where system upgrades have been frozen through January or February in order to keep their environments Y2K-ready.

Plus, decimalization could more than double the number of stock quotes and messaging traffic that brokerages will have to handle due to a rise in the variations of stock prices, according to a study conducted by SRI Consulting in Ar-

Traffic Jam

If stock prices were changed from tractions to nickels . . .

Trade volume and quote volume would each rise 3.5% on Nasdaq and listed equity markets by 2001

1 stack prices were changed is a retail of ons to pennies . . .

Trade volume would rise 80% and quote volume would go up 139% on listed equity markets. On Nasdaq, trade volume would rise 81% while quote volume would surge 231%.

lington, Va. (see chart). That | mation Services in Mount Laucould force brokerages to upgrade most, if not all, of their processors, application software and network capacity that support trad-

"I'm not sure exactly how much investment will be required, but I've seen the [budget] numbers, and it's scary," said Elizabeth Weintraub, IT director at Bernard L. Madoff Investment Securities in New York.

Although no one can say for sure how decimalization will affect messaging traffic, "we have

to assume the worst with these forecasts - spend for additional [systems] capacity" because it will eventually be used, suggested Scott Abbey, chairman of the Securities Industry Association's (SIA) decimalization committee and CIO at PaineWebber Inc. in New York. The SIA is a trade group in New York and Washington that's driving the move to decimalization.

If the volumes of quotes increase as expected, then Wall Street firms like Goldman, Sachs & Co. will need a T3 upgrade to handle the extra traffic, according to the Options Price Reporting Authority, said Leo McBlain, vice president of ADP Brokerage Inforrel, N.J.

While Abbey and other speakers implored attendees to start spending now, an SIA

> survey of 600 firms found that fewer than half had actually developed a project plan as of July. Decimalization is slated to be phased in between July and October next year (see related story at right).

"It's not as if securities firms don't have enough on their plate," said Judith Poppalardo, associate general counsel at the SIA.

Poppalardo noted that Wall Street has other near-term projects, such as converting customer assets and portfolios to recognize the euro currency that's being phased in through

Proponents of decimalization say they believe that the shift will help make U.S. markets like the New York Stock Exchange Inc. (NYSE) even more competitive with international markets that already price stocks and options in 10ths rather than 16ths, while making it easier for U.S. investors to understand stock prices.

Skeptics, however, worry that decimalization will cause the "spreads" — the difference between a bid and offer price — to shrink, potentially resulting in lower profits.

Meanwhile, the SEC doesn't want to mandate a minimum price variation of either a nickel or a penny, even though a shift to penny-based pricing "could exhaust existing message traffic capacity," said Richard Strasser, assistant director of the Office of Market Supervision at the SEC in Washington.

With less than 10 months to revamp their systems, Wall Street IT professionals said they would like to know which it's going to be.

'Programmers need to know the specs before they can begin making changes," said Thomas Quinn, vice president of equity industry initiatives at Merrill Lynch & Co. in New York. "The window [of opportunity] that we're looking at is very narrow."

Decimalization: A Work in Progress

While both the SIA and the SEC are fully behind a shift toward pricing stocks and options in decimals, Wall Street professionals are clearly confused about the lack of regulatory action behind the move.

For starters, Congress hasn't voted on the proposal, and it's not certain that it will. In addition, the SEC, the industry's main regulatory body, says it doesn't believe that a mandate "appears to be a necessity. . . . Everybody agrees that it's going to happen," said Richard Strasser, assistant director of the office of market Washington.

Strasser and other officials from the NYSE and the SIA were repeatedly asked by conference attendees about the likelihood of the July 2000 deadline being slipped. "You shouldn't think about slippage - focus on the July deadline," suggested Strasser, who declined to comment as to whether the SEC would penalize brokerages that missed the deadline.

Brian McNamara, vice president of rules and policies development at the NYSE, said it was "hard to say" whether any slippage on the decimalization deadline would affect the board's plans to introduce after-hours trading

When asked what would compel the SEC to reconsider the July deadline, Strasser had little to offer. "How do I answer that?" he

conference Chairman Scott Abbey, CIO at New York-based PaineWebber, quipped, "I'm not sure that people having to work 20-hour days for the next 10 months would be a compelling argument for the SEC" to postpone decimal-based pricing.

- Thomas Hoffman



"WE HAVE TO AS-SUME THE WORST," says Scott Abbey of PaineWebber and the SIA





Just mail or fax this completed coupon or contact APC for your FREE Enterprise Solutions Kit. Better yet, order it today at the APC Web site!

http://promo.apcc.com n702z

(888) 289-APCC x7678 • FAX: (401) 788-2797



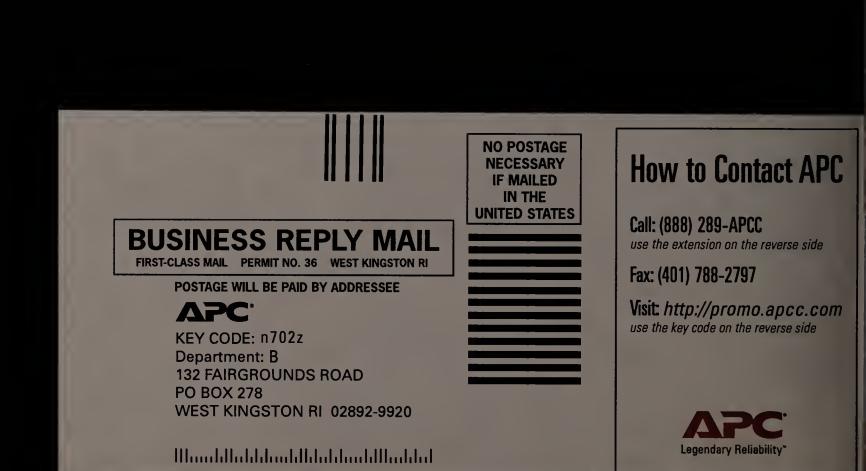
1 - 4=		F
	_	
		32 0 mm

	NO, I'm not interested at this time, but	G
	p.	0

please add me to your mailing list. n702z Enterprise Solutions Kit. Brand of PC used?

Brand of Servers used?

©1999 APC. All trademarks are the property of their owners. APC2F9EB-US • E-mail: apcinfo@apcc.com • 132 Fairgrounds Road, West Kingston, RI 02892 USA



Introducing APC's newest solutions for enterprise datacenter availability





Symmetra™ Power Array™

The solution to growing datacenters

- Maximum uptime is guaranteed by unique single-phase Power Array™ power sharing technology
- Scalability allows modular expansion and reconfiguration as your datacenter grows
- Simplified maintenance dramatically lowers cost of ownership
- Highest availability/lowest operating costs in the marketplace
- N+1 redundancy design assures continuous availability
- · Serviceable while load is up and running

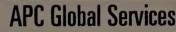
Silcon® DP300E Family

The solution for site-wide power protection



- 3-phase growth path from 10 kVA to 4 MW safeguards your investment
- Innovative Delta Conversion On-line[™]
 design means unmatched efficiency and
 low operating costs
- Smaller footprint and cabling reduce cost of ownership
- Saves up to 18% in energy loss over traditional legacy UPS design
- Reduction in harmonic current from 30% (legacy) to 3%
- Up to nine units can be run in load sharing/redundant mode

Establishing a relationship with APC can save you millions of dollars. It can also ease the pain of having to manage the uncertainty of power-related downtime. *Computerworld* readers choose APC for reliability 10-1 over any other brand. Find out what 8,000,000 customers and 8,000 resellers in over 120 countries have already discovered: APC's Legendary Reliability™ is unmatched in the industry. Contact APC today and let our integrated datacenter power management solutions work for you.



The solution for pro-active power protection

- Quality solutions tailored to meet your requirements
- Provides a road map for implementing a power protection strategy that works
- PowerAudit™: the comprehensive, power quality consulting program
- Proper installation, proactive maintenance and cost-saving analysis
- Cost-effective 24x7 services that focus entirely on power quality
- Attractively priced services bundles available
- Guaranteed satisfaction or your money back
- 5,000 employees and over 8,000 business partners worldwide to serve you

Find out why APC has won over 130 awards for reliability and visit www.apcc.com today.





"When the tax practice is without computers, \$35,000 per hour in revenue and production is lost. We need APC Symmetra™ to help us keep our platform stable."

Bill Cope, Network Analyst,



"The professionalism and thoroughness exhibited by the representatives of APC's Global Services Group in explaining all facets of the transition sold me on the APC Silcon" DP300E solution."

Franco Pasquale, Simulator Team Leader,
Boston Edison



"With untested wiring in the new building and a network that needed to come online quickly, we felt the APC Global Service PowerAudit" could help us identify and prevent any potential power problems."

Scott Davidson, Manager of Development and Operations, Sarcom



FREE Enterprise Solutions Kit. Get Legendary Reliability for your network.

To order: Visit http://promo.apcc.com Key Code n702z • Call 888-289-APCC x7678 • Fax 401-788-2797

©1999 American Power Conversion. All Trademarks are the property of their owners. APC2F9EF-US • PowerFax: (800)347-FAXX • E-mail: apcinfo@apcc.com • 132 Fairgrounds Road, West Kingston, RI 02892 USA

What is Windows NT Advantage?

Windows NT Advantage is the partnership of Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT technology by providing tirnely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 on Compaq hardware using Compaq services and solutions.

Online This Week

Q&A With Brent Harman: Ultimate Windows 2000 Insider

Our exclusive one-on-one interview with Compaq's program manager for Windows 2000, Brent Harman. He tells us what it's like being on the bleeding edge of Windows 2000 implementation and development.

Compaq Portables Deliver — in Extreme Situations

From the extreme cold of Mount Everest to the heat of Death Valley (and a car crash to boot, see photo ▶), Compaq's Armada notebooks keep on running.



Ouickpoll

Will you be seriously investigating a Windows 2000 implementation within the next 24 months?

Migrating from Windows NT to Windows 2000 is a major step forward for thousands of businesses. The transition involves more than just an upgrade — it requires significant advanced planning. How many of your peers are developing those plans now?

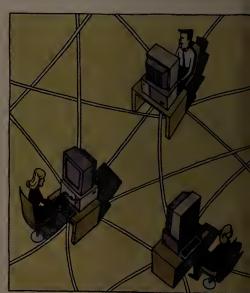
Cast your vote now at www.WindowsNT-Advantage.com.

Microsoft[®]

COME

WindowsN

Deploying Windows 2000 in Intranets



Web tasks are automated, users more productive

By Shari L. Jones and Steven Gould

Organizations are relying on advanced Web technologies to more effectively communicate with partners and employees via their intranets. Windows 2000 Server works with the client-based Windows 2000 Professional to integrate Internet technologies and services — including file-and-print services and advanced busine application services. Windows 2000 Professional and Windows 2000 Server will work together to greatly enhance intranet-based business communications.

It is now common knowledge that Windows 2000 Professional was designed to replace Windows 95/98 as the standard Window desktop client for business environments. In this area, Microsoft's target audience consists of desktop and mobile users from organizations of all sizes.

But why should your company migrate to Windows 2000 Professional on the client side for purposes of intranet communications?

Windows 2000 Professional:

- Automates common Web tasks.
- Makes users more productive by using a simpler, more intelligent interface than that of Windows NT 4.0 or previous Windows operating systems.
- Makes it easier to configure a user's computer and its settings. New wizards help administrators configure Windows 2000 Professional.

Microsoft Windows 2000 Server, which replaces Microsoft Windows NT Server, is expected to deliver higher levels of overall system reliability and scalability than its predecessor.

Windows 2000 Server integrates critical services required for building powerful, component-based Web applications. These services will enable corporate developers to easily write, develop and deploy component-based Web applications. Windows 2000 Server also includes application server technologies that help firms build, deploy and manage server applications using Microsoft's Component

Object Model technologies. Key component services include integrated support for advanced data access, load balancing, asynchronous communication and transactions. Componen services are ideal for developing ecommerce and business applications with Web-based interfaces.

Building on the success of Window NT Server 4.0 as a Web applications and communications platform, Windows 2000 Server integrates pow erful Internet application services. Integrated Internet services throughout the operating system enable organiza tions to respond quickly to change, deploy solutions efficiently and bring existing investments to the Web. The stability and security of Windows NT and the familiar interface of Wi 95/98 found in Windows 2000 provide integrated application support. With that support, existing applications rur better because they take advantage a more reliable and faster server ope ating system.

For more on Windows 2000 and intranets, visit www.WindowsNT-Advantage.com.

Advantage

The Strategic Information Magazine for IT Leaders

How to stay in control of PC changes

Compaq tracks tech tweaks so you can mind the store

By Philip Kay

Updating a computer system is a hassle for a single user, but for a corporation it can be a nightmare. In today's world, where computer systems evolve continuously, the need to update is constant and unrelenting. As a result, controlling and managing change is essential.

How do companies know when an update is necessary, for example? What if the updated software conflicts with a legacy application? And how should the update be implemented?

Mindful of the cost and difficulty that updates can cause corporations, Compaq is offering its corporate customers free change management and change notification services as part of its PC Lifecycle program.

Like Microsoft's Windows Update, the service helps IT managers decide what changes are necessary and how they can be best imple-

To learn more about these topics, visit our Web site at www.WindowsNT-Advantage.com.

mented. Compaq's service goes a step further, however, by accumulating small changes into bundled production releases so that only new technologies with a significant benefit to the customer are introduced as incremental components.

This strategy helps extend the lifecycle of the PC, and thus reduces the total cost of ownership.

"Compaq's change control program is very informative and is a critical business tool for our IT organization," says Wayne Kaufman, vice president of Enterprise Technology Services at Merrill Lynch. "It allows us to know well in advance what types of changes are occurring so that we can decide how they will affect our business. This helps us know if we should evaluate and test an update or skip a generation."

To provide the service, Compaq will evaluate whether changes to components, ROM or software are necessary, and design an appropriate update process. To ensure that IT departments can keep abreast of necessary changes, the company has also created a change notification Web site (www.compaq.com/notification). The goal is to notify customers of all necessary changes at least 60 days in advance. Compaq customers need only register to receive change notification bulletins via e-mail.

For more on change control, visit www.WindowsNT-Advantage.com.



Published by COMPUTERWORLD ENTERPRISE BUSINESS SOLUTIONS

Point of View

Compaq serves up scalability eight ways

Compaq — the first and still the only company making eight-way servers —continues to perfect the technology. These eight-processor machines have scalable technology that boasts superb reliability, combined with a reduced cost of ownership.

Eight-way servers are fast. And all that redundancy is a clear path to reliability. Beyond that, their sheer horsepower sets them apart from the past crop of servers.

Illinois Power is one happy eight-way customer. As a beta user of the PL8500, the Midwestern utility put the server through the numbers using Windows NT 4.0, an Oracle8 database and Failsafe. illinois Power is using Clustered PL7000 to run an Energy Management System in real time.

This is a mission-critical application, which is unusual for a beta test. The system monitors alarms, which could indicate an ice storm downing a power line. The system must provide 99.998 availability, according to Mike Hammon, senior information systems specialist at Illinois Power.

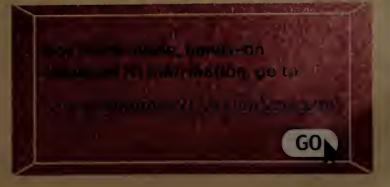
"Because system downtime costs us more than \$1 million an hour,

Illinois Power requires the highest levels of fault tolerance and performance," Hammon says. "Compaq's ProLiant eight-way SMP servers give us the power to achieve subsecond, real-time responses and the availability to ensure that the lights stay on 24 hours a day, seven days a week."

With a four-way, 450-MHz Xeon PI7000, Illinois Power can monitor 7,500 alarms per minute. Testing has shown they can support 15,000 alarms per minute. It's that kind of scalability that makes eight ways more marketable and affordable for larger customers.

Another beta customer reports equally startling numbers.
Weston Group Inc., a global distributor of networking technology products, is currently using PL6500/PL7000 running JDE and Oracle.

Robert Gordon, manager of global information systems at Weston. put Citrix Winframe on a testing Terminal Server. The result was an increase in users by 75% over similarly configured four-way servers. Gordon plans to deploy eight-way server this year running on Windows NT 4.0. §



Microsoft Deal Augments Ford's Web Presence

Online car-delivery system is automaker's latest Internet link with customers

BY KATHLEEN MELYMUKA

announcement last week of a joint venture with Microsoft Corp. to provide the first online, build-to-order, car-delivery system is the latest gambit in CEO Jacques Nasser's push to link Ford with its customers via the Internet.

"Nasser wants Ford to be a consumer company, and one of the major means of getting there is e-business," said John Iordan, director of e-commerce research at the Ernst & Young Center for Business Innovation in Cambridge, Mass.

In the deal, Ford will hold a minority interest in Microsoft CarPoint and work with Microsoft to develop a system for the CarPoint Web site that will link consumers directly to Ford's supply and delivery systems.

Once a consumer has configured his car order, the system will locate an existing car or place an order for one to be built at the factory. The car will be delivered through the

consumer's local dealership.

Nasser also formed a new Ford division called the Consumer-Connect Group, which will be responsible for all di-

rect consumer contact and for integrating retail dealerships into the company's Internet activities.

"These are a couple of steps in a many-step process, to be on the leading edge," said David Cole, director of the Office for the Study of Automotive Transportation at the University of Michigan at Ann Arbor. The Consumer-Connect Group will also oversee three other Ford Web sites: BuyerConnection, which provides local dealer price quotes and credit and insurance applications; DealerConnection, which provides details on local inventories and special deals; and

> OwnerConnection, which provides a virtual community of owners from whom the company can

gather feedback while building an ongoing relationship.

The Internet approach is a huge change for the auto industry, Jordan said. "The overall impact of e-commerce is much more customer-driven interactions. That's such a challenge to the auto [manufacturers'] mind-set, because their dealership network has always been the key way of interacting with customers," he explained.

In other Internet initiatives, Ford has made exclusive agreements with community Web sites, such as iVillage for women and Digital Entertainment Network for young people, to test alternative ways of connecting with consumers.

Earlier, the car company was

the first manufacturer to take an equity stake in Carclub.com, which provides automotive-related products and services.

Taken together, these sites create a substantial Web presence for Ford and serve as a platform to gather feedback and data directly from consumers — something car companies previously left to their dealers.

"Customer data is absolutely crucial, but manufacturers [traditionally] have very little visibility to the customer," Jordan said.

In the past, this lack of communication has resulted in bizarre auto designs, such as minivans with 17 cup holders, Jordan said. "What are they thinking?" he said. "They get weird mixes of focus-group input. They say they want cup holders, so we'll give them atomic-powered cup holders!"

Ford wants to change all that, but like every player in the industry, it's struggling to figure out how. "Electronic commerce and IT are going to be a central player in whatever the auto industry turns into," Cole said. "The challenge for the industry is to keep up with the culture and the technology. No one is sure where this is all going, but they know it's going, and they just want to be on board."

CA Buys Network Security Software Firm

Will integrate VPN into eTrust products

BY SAMI LAIS

Security software maker Snare Networks Corp. in Silver Spring, Md., last week became the latest acquisition by Computer Associates International Inc. in Islandia, N.Y. Terms weren't disclosed.

It was SnareNet VPN that was a prime attraction for CA, said Kurt Ziegler, vice president of security at CA. Snare Networks also makes SnareNet, a data encryption product for TCP/IP applications that has sold 600,000 licenses, mostly in government and banking.

The SnareNet technology will be integrated into CA's eTrust security products. It will be released within the next two months as eTrust VPN, Ziegler said.

"It's a nice fit for CA," said Matthew Kovar, an analyst at The Yankee Group in Boston. "A lot of their products need to be able to communicate securely over the LAN and the larger WAN environment, and this will let them do that."

The SnareNet VPN product

Merging Products

nareNet features to be integrated into head which

- Virtual private network capability, and RSA and 3DES encryption
- Tunneling across a public network from remote user to host, server to server or user to user
- Encrypted payload within a private network from server to server, user to server and user to user

Coming by year's end:

■ Integration of public key infrastructure capabilities

differs from other virtual private network (VPN) software in that it doesn't reside on or at the firewall, but on servers within the network. Administration of payload encryption and VPNs is from a central server.

Integrating security measures at the firewall may be more cost-effective for smaller organizations, but "when company assets have a higher value, it's more applicable to use stand-alone devices," Kovar said.

"If you put a router, firewall and VPN on one device and the firewall goes down and brings the whole box down, [network staff] will bring the router up immediately to get the network up and worry about the firewall later," he said.

CA's eTrust family of security products has had payload encryption capabilities via Hoffman algorithm-based technology from recently purchased Platinum Technology and CA's CryptIT, which included a proprietary low-overhead cipher.

Snare Networks developers will continue at the Silver Spring location, working on further enhancements to eTrust, including integration of public key infrastructure capabilities, expected by year's end, Ziegler said. •

CA Buys Utilities Developer, Might Face Off Against BMC

Could lead to price war in the future

BY ROBIN ROBINSON

Computer Associates International Inc. has purchased Innovative DP Designs Inc. (IDI), a developer of utilities for the IMS database. When that is combined with its purchase of Platinum Technology International earlier this year, the Islandia, N.Y.-based software giant will be in a position to compete with BMC Software Inc. in the mainframe database market, possibly igniting a price war between the two firms.

"CA is clearly attacking [BMC]," said Jonathan Eunice,

an analyst at Illuminata Inc. in Nashua, N.H. "There's going to be a price war now that there's a competitive alternative."

Walter Klay, head of database systems at Switzerland's Zuercher Kantonalbank and a user of both CA and IDI products, said, "By bringing IDI's tools to its broad line of mainframe products, CA will deliver the kind of advanced integrated solutions that'll make our purchasing decisions even simpler."

IDI employees will remain at their Napa, Calif., office after the acquisition.

The purchase price of the private company wasn't disclosed, and the sale isn't subject to regulatory approval.

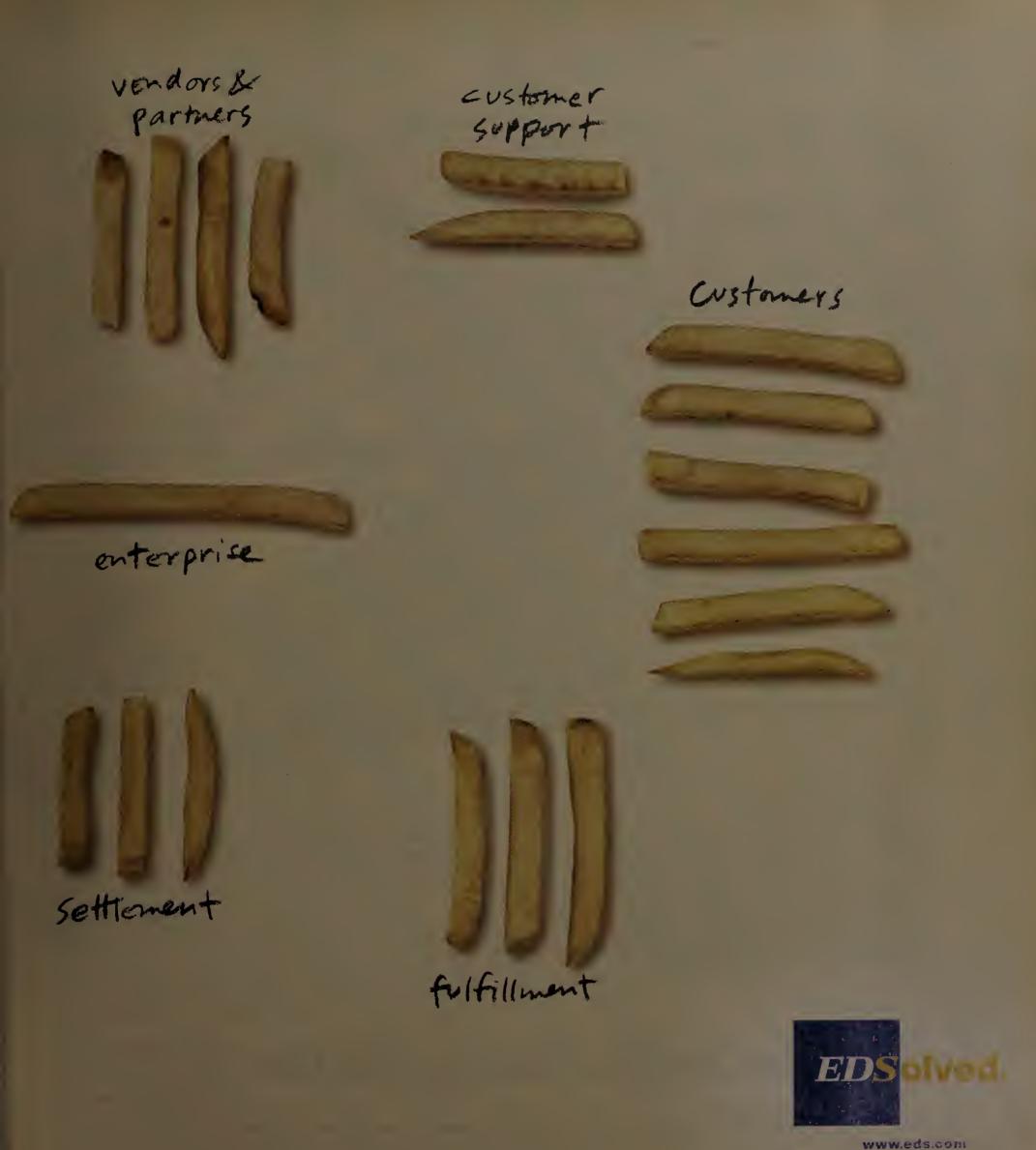


suppliers

e-procurement

govern mant

financial



Your electronic business needs hundreds of behind the scenes players to make sure what the customer sees is accurate, easy, understandable and friendly. We'll help you integrate your supply chain, link by link, french fry by french fry. From idea to strategy to implementation. Then to lunch. To learn more about us, call 800-566-9337 or check our website.

With 100 Days to Go, Users Have Few Big Y2K Worries

Cap Gemini survey shows most glitches have been minor and compliance is up

BY KATHLEEN OHLSON

HUNDRED days before the year 2000, some eight out of 10 large corporations don't foresee any "significant business risk" when their internal systems roll over, according to the survey "100 Days to Go," released last week by Cap Gemini America Inc. and Rubin Systems Inc.

Confidence was even higher in a new Computerworld survey (see story on page 47).

Cap Gemini is a New Yorkbased management consulting and information technology services group; Rubin Systems is an IT and software performance improvement/coaching service in Pound Ridge, N.Y. The survey questioned IT directors and managers from 156 companies in the financial services, manufacturing and insurance industries.

If there's any good news about the money companies have spent on the date-change problem, it's that IT is now visible on the business side, according to the survey's findings. But Y2K hasn't eaten up much of some companies' budgets, said Howard Rubin, CEO

of Rubin Systems, during a press conference last week.

Financially wealthy companies are spending only 5% to 8% of their IT funding on Y2K, while poorer companies are spending up to 40% of their IT budgets readying systems for Y2K, according to the report.

Andy Bochman, an analyst at Boston-based Aberdeen Group Inc., said the U.S. is well prepared for the Y2K rollover, but a flag is being raised by Cobol programmers: Despite system testing, there may be a number of errors not yet found in the code that will cause problems when the date really changes, Bochman said.

Some Minor Failures

Some firms have already experienced Y2K-related failures. According to the study, 82% had minor failures — up from 75% in August — but that's because more companies are rolling out their code now, Cap Gemini said. Fifty-six percent of the failures were caused by systems that hadn't been upgraded or replaced, followed by 44% that were already Y2K-fixed.

Nearly all experienced some miscalculations financial (95%) and processing disruptions (92%). Fewer have had logistics/supply-chain problems (36%), customer service problems (33%) and actual

business disruptions (2%).

Trigon Blue Cross/Blue Shield experienced some incidents related to its Y2K fixes. Based in Virginia, Trigon has 4,000 employees, who serve 1.9 million health plan members. Dan Clark, director of application services, said data was incorrectly updated but was quickly fixed before it impacted business.

"Some systems won't be fully compliant by the rollover," said Jim Woodward, Cap Gemini's senior vice president. But any glitches will hopefully be offset by crisis centers and

contingency strategies, he

But Bochman said that if systems fail, "then [companies] probably did a half-assed job fixing the problem...and we're all going to get killed."

Meanwhile, top corporate managers are now seeing the importance of IT. Rubin said business managers are becoming more involved with IT projects and IT in general, taking control of operations and budgets. One dollar out of every \$4 is now being set aside for IT projects, Rubin said.

'Cyberterrorists' Could Be In Your Own Backyard

Unhappy Y2K fixers a cause for concern, says security expert

BY GARY H. ANTHES WASHINGTON

To your list of year 2000 worries add the possibility that a disgruntled employee has put a virus or Trojan horses into your code as part of his Y2K "remediation" effort.

Scanning the remediated source code won't find the rogue software because it was added to your object code by a rigged compiler, according to security expert Alan Paller, research director at the SANS Institute in Bethesda, Md.

In a briefing to system and network administrators and security professionals here Sept. 16, Paller outlined a number of scenarios — some real, some hypothetical — illustrating the risk systems face from "cyberterrorists." He demonstrated several powerful hacking tools that anyone can download from the Internet and apply with very little know-how.

Paller said consultants doing "penetration testing" for clients typically find from five to 30 vulnerabilities per system. But administrators are often so overworked that they patch only a fraction of the holes found, he said.

And administrators face other pressures. "Their bosses tell them, Just get this one project done and then you can get back on security fixes," Paller said. Complaining to management about a lack of resources to improve security "just sounds like whining," he added.

Paller said that SANS, an information security education and research group, recently teamed with security experts to map out some practical steps to improving security. They are developing a three-

Who's Breaking **Into Your** Systems?



- Disgruntled existing and former employees and contractors
- Organized crime (extortion, money-laundering, insider trading)
- Cybercriminals (fraud and information reselling)
- Kids and teen-agers
- Other (including governments)

level scheme that will help users take the easiest but most important steps first, he said.

Less Than 100 Days to Go

From a survey of executives at 156 large corporations:

56% Expect their critical systems to be 100% year 2000-compliant, up from 48% in August

Expect to have between 76% and 99% of their systems compliant

Anticipate wrapping up between 50% and 75% of their systems by year's end

Tokyo Court Halts Production of iMac Clone

stop to the production and sale of a machine whose curvy, translucent design is similar enough to Apple Computer Inc.'s iMac to "confuse" customers, it said.

The Tokyo District Court's preliminary injunction prevents Yokohama-based Sotec Co. from manufacturing, sell-

A court in Japan has ordered a | importing its e-one PC, a court | machine in Japan in July. The spokesman said last week. Apple's local subsidiary filed a suit against Sotec last month.

Judge Toshiaki Iimura was quoted in a business daily as saying that the two PCs aren't only similar in their choice of color, material and curvature, but also in their details.

Sotec started selling its cut-

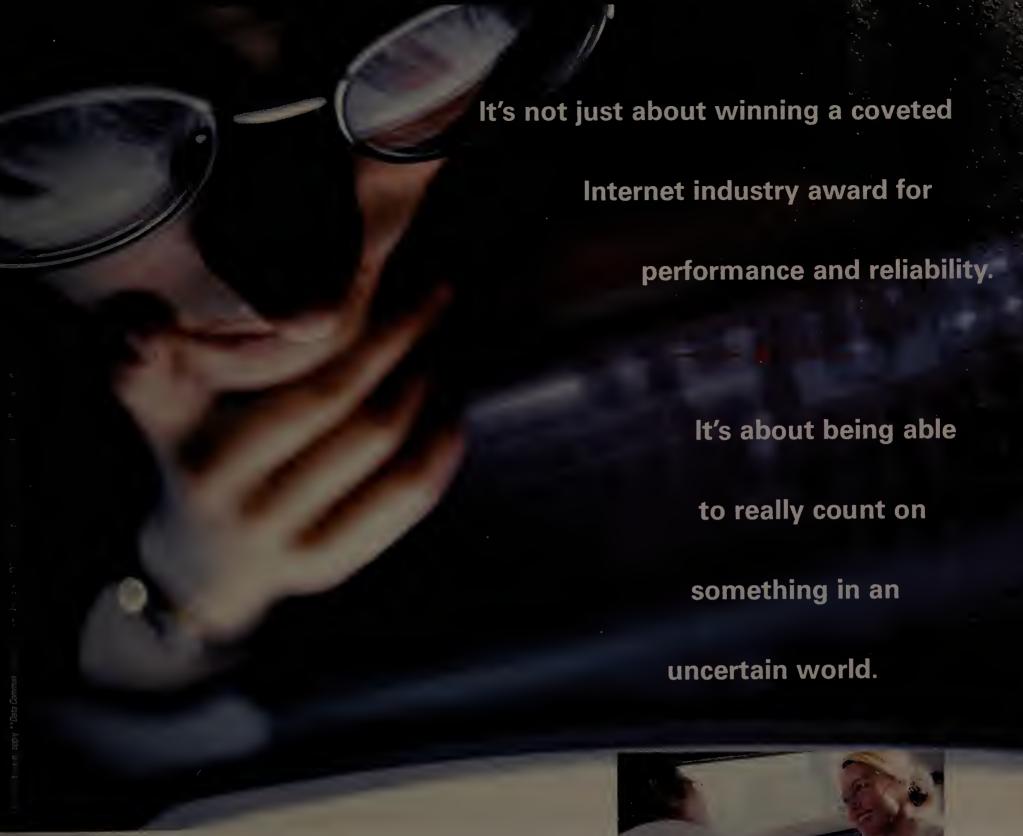
ing, displaying, exporting or | price Windows 98-equipped e-one retails there for around \$1,200, about 23% less than Apple's iMac.

> In the U.S., Apple sued eMachines Inc. last month, alleging that the company's bargainbasement eOne machine was an iMac knock-off. An Apple spokeswoman last month said eMachines' PC and the Sotec | Service in Tokyo.

PC are in fact the same computer. EMachines is a venture among Korean PC manufacturer TriGem Computer Inc., monitor maker Korea Data Systems and other investors.

Apple also filed a suit against Korea's Daewoo Telecom and its joint venture Future Power July 1, alleging that the company's bubble-shaped PC pilfered its basic design from the iMac.

Drexler writes for the IDG News



Sign up now for fast, reliable, award-winning Net connection with Sprint Dedicated Internet Access Services and we'll waive the installation fee.*



You can ensure peak performance for your data network with Sprint Dedicated Internet Access Services. When Data Communications magazine tested some of the largest Internet service providers in the country, Sprint won their Internet Backbone Tester's Choice award, surpassing or equaling every competitor in every category!**

Sprint's industry-leading SONET-based network is one of the most advanced and reliable in the world, providing exceptional survivability and service consistency. Our data-carrying capacity gives you fast transmissions. And with our service guarantees, you can count on 99.9% or better end-to-end availability.

It's never been easier to put your business on the fast track with the cutting-edge technology of Sprint Dedicated Internet Access services. Right now, for a limited time, we'll waive installation fees for any contract of two years or more. Sign up today to get the performance, reliability and security you demand. And enhance the way your business serves customers. Isn't that the point of contact?



For more information or to sign up, call toll free

1.877.29.IPNOW

Visit our Website at www.sprint.com/ipnow



GROWTH HAPPENS. MANAGE IT.



DELL SERVERS, DESIGNED TO GROW WITH YOUR BUSINESS.

Whether you're just starting a network or adding onto a business-critical system, Dell offers a range of reliable servers for your growing business. They have the capabilities to handle basics like file sharing to advanced functions like e-commerce. And along with the usual 7x24 dedicated server telephone and online support and three-year nextbusiness-day on-site³ service, you also get 30-day "Getting Started" OS telephone support, perfect for the growing business that needs to keep moving to survive. Call, or visit www.dell.com for your custom-built server today.



The Dell® FowerEdge® 1300. An affordable server designed to offer a cost-effective, entrylevel network solution.



The Dell PowerEdge 2300. Ideal for growing businesses, the PowerEdge 2300 provides the added reliability of optional redundant hotswap drives.



The Dell PowerEdge 4300/6300. For additional redundancy and increased availability, turn to the PowerEdge 4300 and 6300 servers, featuring redundant hot-swap hard drives, power supplies and cooling fans.

DELL® POWEREDGE® 6300

Up to Quad Pentium® III Xeon™ Processors from 500MHz - 550MHz

DELL POWEREDGE 4300

Up to dual Pentium III Processors from 450MHz - 600MHz

DELL POWEREDGE 2300

Up to dual Pentium III Processors from 450MHz - 600MHz

DELL POWEREDGE 1300

Up to dual Pentium III Processors from 450MHz – 600MHz

starting at \$7539

Business Lease¹⁵ starting at \$249/Mo., 36 Months

starting at \$2999

Business Lease¹⁵ starting at \$100/Mo., 36 Months

starting at \$1939

Business Lease¹⁵ starting at \$65/Mo., 36 Months

starting at \$1549

Business Lease¹⁵ starting at \$52/Mo., 36 Months

FEATURES

256MB up to 4GB4 ECC EDO RAM 9GB4 (7,200 & 10,000 RPM) up to 36GB4 Ultra-2/LVD SCSI Hard Drives Up to 252GB4 Internal Storage Capacity

FEATURES

128MB up to 2GB4 100MHz ECC SDRAM 9GB4 (7,200 & 10,000 RPM) up to 36GB4 Ultra-2/LVD SCSI Hard Drives Up to 252GB4 Internal Storage Capacity

64MB up to 2GB4 100MHz ECC SDRAM 9GB4 (7,200 & 10,000 RPM) up to 36GB4 Ultra-2/LVD SCSI Hard Drives Up to 144GB4 Internal Storage Capacity

64MB up to 1GB4 100MHz ECC SDRAM 9GB4 up to 36GB4 Ultra-2/LVD SCSI Hard Drives Up to 108GB4 Internal Storage Capacity

RELIABILITY/AVAILABILITY



E•VALUE COOE: 31196-290975

ECC Memory, RAID Capable, Hot-Swap Hard Drives, Hot-Swap Power Supplies & Cooling Fans, Hot-Swap PCI-ready Slots

RELIABILITY/AVAILABILITY



E-VALUE CODE: 31196-290929

ECC Memory, RAID Capable, Hot-Swap Hard Drives, Hot-Swap Power Supplies & Cooling Fans

RELIABILITY/AVAILABILITY



E•VALUE CODE: 31196-290919a

ECC Memory, RAID Capable, Optional Hot-Swap Hard Drives

RELIABILITY/AVAILABILITY



E-VALUE COOE: 31196-290915

ECC Memory, RAID Capable

COMMON FEATURES: 512KB Integrated L2 ECC Cache, Intel® Pro/100+ PCI Ethernet Adapter, Integrated Ultra-2/LVD SCSI Controllers, 40X Max⁶ Variable CD-ROM Drive, Performance Keyboard, Mouse, HP® OpenView™ NNM Special Edition, Tool-Less Chassis Designs, 3-Year Next-Business-Day On-site³ Service, 7x24 Dedicated Server Hardware Telephone and Online Technical Support

AWARDS Network Computing's "50 Best Products of the Year" - (6300-Enterprise Server), 5/99. • Network Magazine's "1999 Products of the Year" - (2300-Workgroup Server), 5/99.

800-433-7303



USE THE POWER OF THE E-VALUE™ CODE.

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E • VALUE CODE OR GIVE IT TO YOUR SALES REP

WWW.DELL.COM/EVALUE





Phone Hours: M-F 7a-9p • Sat 10a-6p • Sun 12p-5p CT • In Canada, call 800-232-6306 • In Mexico, call 01-800-021-4531 • GSA Contract #GS-35F-40760

For a complete copy of Guarantees or Limited Warranties, write Dell USA L.P., Attn: Warranties, One Dell Way, Box 12, Round Rock, TX 78882. Prices and specifications v. d. n. without notice. 30n-site service may be provided by a third-party provider under contract with Dell, and is not available in certain areas. Technician will be dispated of the stroubleshooting. For hard drives, GB means 1 billion bytes, total accessible capacity varies depending on operating environment. \$14X Min. 18 Business leasing arraid. De independent entity, to qualified customers. Above lease payments based on 36-month lease, and do not include taxes, flees, shipping charges, subject to one taxed provided by the little line of th



SAP Dedicates Staff for Footwear, Apparel Customers

SAP AG's U.S. subsidiary has set up a team of technical consultants responsible solely for

working with users who are installing the German vendor's version of R/3 for apparel and footwear makers.

Apparel and Footwear Solution (AFS) after early users of the software had problems that | consultants from its wider

SAP is trying to stabilize its | led several to stop work on their projects [News, July 12].

Until now, SAP was pulling

consumer products group to deal with AFS installations.

The AFS team has 35 consultants, and that number is expected to grow to 50 by year's end, said Annegret Sonnenberg, vice president of the retail and consumer products unit. Their job is to help users expedite software fixes being developed at SAP's German labs.

"We needed people who know exactly what that product can do," Sonnenberg said. The 60-plus companies that have bought the AFS software are typically smaller than most manufacturers with R/3, "and they need someone who speaks their language," she added.

About 20 users have gone live with AFS, and SAP shipped new bug fixes two weeks ago. More fixes are under way, "but we feel that it's much more stable than it was," Sonnenberg said. By early next year, she said, SAP hopes to ease restrictions that have limited purchases of AFS since stabilization work began last spring.

IBM Alters Pension Rules

BY STEWART DECK

After fielding thousands of calls from disgruntled workers and even hearing from several members of Congress, IBM has adjusted its pension plans to double the number of employees who can choose between the old plan and a new one that went into effect July 1.

The new plan is a "cashbalance" setup that offers more monetary benefits earlier but features a fixed growth rate for all except grandfathered, longtime employees. The old plan is slower to accrue but delivers a potentially bigger payout at retirement.

The adjustments will allow as many as 65,000 IBM workers to participate in the older pension plan, including any worker over age 40 who has 10 years of service or more

we were trying to strike the right balance between the needs of our employees and the marketplace," said Jana Weatherbee, an IBM spokeswoman. The new plan is an attempt to appeal to younger, more mercurial workers and help IBM "recruiting-wise and retention-wise," she added.

With a Caché database license, you can speed up your development.

With Caché, the post-relational database, you can develop complex applications so fast it's like owning a "License to Speed."

With advanced object and Web technologies, Caché can dramatically speed up your time-tomarket. But Caché gives you more than a rapid application development environment.

Once deployed, Caché-based applications are so fast we've had customers get up to a 20x boost in SQL performance after switching their database. And without changing a single line of application code.



Do you still peddle applications that run on a relational database engine?

Entitles you to speed up application development and performance All this is made possible by Caché's multidimensional data server and applica-

tion server, offering you multiple ways to access data, multidimensional storage architecture, scalable performance, plus richer technology for faster Web and object development.

Caché comes from InterSystems, the leader in high-performance database systems, with over 2,000,000 licensed users worldwide, 20 years of database experience, and 24 x 365 support.

If you want to speed things up, start by moving quickly to call us at 1-800-753-2571. We'll rush information to you about the DBMS that is so advanced, it won the "Best New Database of 1998" award.



www.LicenseToSpeed.com One Memorial Drive, Cambridge, Massachusetts 02142 1.800.753.2571

Xerox, Tektronix In \$950M Merger

In a bid to challenge HewlettPackard Co. for the color-printer
crown, Xerox Corp. last week
agreed to buy the color printing and
imaging division of Tektronix Inc. for
\$950 million. Xerox will set up a
new business unit, adding Tektronix's color printing technologies
to Xerox's black-and-white workgroup printer offerings. Tektronix's
printer operations will remain based
at the company's headquarters in
Wilsonville, Ore. Xerox plans to
blend its color printer operations in
Webster, N.Y., with Tektronix's.

CSC Purchases Nichols Research

Computer Sciences Corp. (CSC) agreed to buy IT services firm Nichols Research Corp. in a deal valued at about \$400 million. Nichols, based in Huntsville, Ala., derives about 80% of its revenue from services it provides to federal government agencies, said CSC, based in El Segundo, Calif. Earlier this month, CSC said it would buy an Oakland, Calif.-based unit of TRW Inc. that provides customized software and systems for high-volume payment processors.

Short Takes

MICROSOFT CORP. bought San Francisco-based SOFTWAY SYS-TEMS INC., a company that makes Unix/Windows NT interoperability software. Terms weren't disclosed. . . . Citing problems meeting demand for its POWER MACINTOSH **G4 computers, APPLE COMPUTER** INC. said profits and sales for its fourth fiscal quarter will fall short of those a year ago. . . . COREL CORP. in Ottawa posted a \$17.6 million profit on \$71.3 million in revenue for the quarter. The company posted a \$7.8 million loss for the same quarter last year. . . . As expected, CRAIG CUNWAY, 44, last week took over as CEO of Pleasanton, Calif.based PEOPLESOFT INC., immediately replacing founder DAVID **DUFFIELD.... RED HAT SOFT-**WARE INC. last week said its revenue was \$4.4 million in the quarter ended Aug. 31, on which it posed a \$3.1 million loss. The quarter was Red Hat's first as a public company.

Wireless Merger a Boon For National Coverage

Analysts say Bell Atlantic/Vodafone has largest coast-to-coast footprint

BY MATT HAMBLEN

USINESSES buying wireless voice and data services should look for prices to drop and nationwide coverage to expand with last week's creation of a new competitor from Bell Atlantic Corp. and Vodasone AirTouch PLC.

The yet-unnamed wireless alternative "will give businesses an additional choice" over nationwide providers AT&T Corp., Sprint Corp. and Nextel Communications Inc. in Reston, Va., said analyst Ken Hy-

ers at Cahners In-Stat Group in Newton, Mass.

Bell Atlantic in New York and Vodafone AirTouch in London claimed that the new business would be valued at \$70 billion once the merger is finalized in six months to a year. Annual revenue could be \$15 billion, with 2000 profits at \$1.7 billion, officials at the two companies said.

Bell Atlantic is also merging with GTE Corp. in Stamford, Conn., and GTE's assets will be part of the business.

A key reason the new business may lower nationwide

Leaping to the Top Subscribers to nationwide

Subscribers to nationwide wireless services:

Bell Atlantic/ 20M* Vodafone AirTouch

11.5M

4M

AT&T Corp.
Sprint Corp.

Nextel Communications Corp. 3.5M

* Proposed

costs is that roaming costs users pay to pass from one network to another can be eliminated, analysts said.

Compared with the other national carriers, the new entity would have the largest footprint of coverage, about 90% of the U.S. population. And with 20 million subscribers, the venture would have nearly double AT&T's 11.5 million subscribers (see chart).

Jeffrey Kagan, a telecommunications analyst in Atlanta, said the added competition will favor consumers more than business buyers, but both would benefit. "We're moving

toward a day when every member of the family and every worker will carry a cheap, lightweight, portable, wireless phone, and this kind of competition will bring us closer to that day," Kagan said.

Cahners, however, predicts the U.S. cellular phone market will be saturated once it penetrates 55% of the population, now about 272 million people. An estimated 88 million people have a cellular phone, a number that will reach 108 million at the end of next year.

At that point, analysts said, the race will be on to expand bandwidth many times what is available today and make wireless access to e-mail and corporate data more ubiquitous.

Today, about 37% of businesses provide wireless services to their employees, and half that of those negotiate deals with carriers that provide discounts for preset call volumes.

The best advertised plans cost an average of 10 cents per minute if you use 1,500 minutes per handset per month, analysts said.

Cisco Buys Into Online Customer Management

Gains collaboration, e-mail software in WebLine purchase

BY JAMES NICCOLAI

Cisco Systems Inc. last week agreed to buy privately held WebLine Communications Corp., based in Burlington, Mass., for \$325 million in stock. WebLine makes software that helps companies build online customer service and commerce applications.

The acquisition was designed to complement Cisco's purchase in April of GeoTel Communications Corp. Web-Line's software will be integrated with GeoTel's suite of distributed call center software.

Shared Access

WebLine's products include collaboration software that lets multiple users share access to a Web page, form, application or voice call using a Web browser. For example, the software could be used to synchronize the Web pages of a customer and a customer-support agent so that they can work together on a problem, Cisco officials said.

In addition, WebLine makes e-mail management software that lets large companies handle customer e-mails more effectively by managing the routing and response process, according to San Jose-based Cisco.

WebLine has 120 employees, who will continue to work under the company's CEO, Dan Keshian. The company will become part of Cisco's Lowell, Mass.-based Applications Technology Group, which develops infrastructure applications.

The acquisition is expected to close in the second quarter of Cisco's fiscal year 2000, subject to approval by antitrust regulators and other closing conditions.

Niccolai writes for the IDG News Service in San Francisco.

Network, Palm Products Push 3Com Profits Up 38%

Sales up 50% for handhelds in wake of spin-off plan

BY ELIZABETH HEICHLER

Growth in sales of its networking and handheld computer products pushed 3Com Corp.'s earnings for its first fiscal 2000 quarter to \$119.3 million, well over analysts' expectations.

Sales of network systems products were up 9% from last year's first quarter to \$674.2 million; sales of handheld computing products increased 50% to \$174.2 million. But 3Com's sales of personal connectivity

products, such as network interface cards and modems, slid 19% to \$539 million.

Overall, 3Com posted a \$137.5 million proforma profit on sales of \$1.39 billion for the quarter. The profit numbers were 38% higher than the same period last year, excluding results associated with tax credits for its U.S. Robotics merger.

Santa Clara, Calif.-based 3Com two weeks ago said it plans to spin off its handheld computing unit, which makes the popular Palm device, and take that company public [News, Sept. 20].

Heichler writes for the IDG News Service in Boston.

WORLD'S GREATEST GLOBAL INTERNET SUPPLY CHAIN MANAGEMENT INNOVATOR



www.eds.com

"e" is such a broad concept. Can there be such a thing as an "e" expert? Our people are constantly evolving technologically and building on what they know. Ideas, strategies, implementation, managing. We know what we're doing, even if you don't know what we're doing. To find out more about our company and what we do, call 800-566-9337 or check our website.

MARYFRAN JOHNSON

Desktop déjà vu

SUALLY I don't pay much attention to analyst forecasts, which tend to be a predictable mix of what-if scenarios, wishful thinking and wild guessing. So when I read one recent claim that by the year 2003, mobile devices and Internet "appliances" would outnumber desktop PCs 6 to 1, I scoffed.

But the sheer audacious volume of that number — 600 million mobile devices to 100 million PCs — sticks in my mind. Even if the analysts blow it by a couple hundred million, the impact on corporate information technology will be profound.

Already, there are a slew of enterprise IT issues cropping up around mobile computing. There's genuine alarm about the total cost of ownership. Worries about securing and safeguarding corporate data. Training and support issues galore. Management headaches that are heading for migraine territory. Remind you of anything?

Indeed, this is shaping up to be a PC invasion déjà vu. Just as those renegade desktops started trickling into centralized IT operations in the 1980s, mobile devices of all stripes are flowing into companies today. They're coming in faster than desktops ever did, and their owners are more likely to be business execs — not your power techies.



her at maryfran johnson@

computerworld.com.

Gartner Group believes that 60 million people worldwide will be telecommuting and working remotely within two years. Guess what most of those folks are going to need to do their work? Access to corporate data. Yet only a tiny percentage of mobile devices are being managed by IT departments today.

Last week at a mobile computing conference, I was talking with a manager from a well-known financial firm where PalmPilots are

proliferating. When it comes to IT support, however, the Palms officially don't exist. The one glaring exception to the policy is that any executive at the vice president level and higher gets IT support. "They're trying to pretend this isn't happening," this manager said. "How nuts is that?"

How unfortunate it is to see history repeating itself with the same denial reactions that once estranged IT departments from PC users and their "toy machines."

How ABOUT WE PUT COMMANDMENTS 11-20
ON 8-TRACK TAPE?

Digital Amnesia:

The early years

DON TAPSCOTT

Will Third Voice turn your Web site into a voodoo doll?

NOWLEDGE is power, and as we move from the industrial economy to its digital successor, power is steadily moving away from the corporation toward the consumer.

This is really the heart of the debate around the small but powerful piece of Internet software called Third Voice.

The program can be downloaded for free (www.thirdvoice.com) and runs in conjunction with Microsoft's Internet Explorer software.

Once the browser plug-in (motto: Your Web. Your Voice.) is installed, Web surfers can attach electronic "sticky notes" to any Web site. When other Web users running the Third Voice software visit the site, they will see little red triangles that indicate someone else's comments



OON TAPSCOTT is chairman of the Alliance for Converging Technologies. Contact him at column@tapscott.com.

are annotated. Click on the triangles and up pop the notes.

Nothing is changed on the Web site itself. The comments are all stored separately on Third Voice's servers. Accordingly, Web page administrators have no control over the material stuck to their sites.

The software was originally damned by many as useless electronic graffiti, particularly because the notes tended initially to be juvenile or abusive. Go to the White House Web site (www. whitehouse.gov) and there are Monica jokes galore.

But the random graffiti is really a trivial issue, and the software's creators are exploring ways to filter out such junk. The implications of Third Voice are much more dramatic when you appreciate that it could be systematically used against your company.

If your company has a controversial product, your own Web site could become a protest rallying point. If you are an automaker trumpeting on the Web some new gas-guzzling sport utility vehicle, you could find environmental groups plastering complaints, petitions and calls for action all over your site.

Perhaps your Web pages scoop up lots of user information that you sell to other companies. Because relatively few users assiduously scrutinize

UNLOCKING THE SECRETS

of Enterprise Management



Growing businesses turn the power of enterprise management solutions into bottom-line benefits.



Assuring Business Availability™

UNLOCKING THE SECRETS OF ENTERPRISE MANAGEMENT SUCCESS

Mastering the Art of Enterprise Management

By Herb VanHook, META Group Inc.

ompanies that reap the benefits of enterprise management solutions do so because they employ an implementation and evaluation strategy. They focus on common processes, effective use of technology, and optimized organizational models. But in order to successfully align enterprise management initiatives with real business processes, companies must assign value to their management efforts.

True enterprise management excellence results from an organization's ability to measure its service delivery capability "up front" and then capture the effect of technology integration in their service delivery processes. Many companies approach this "capture the value" effort too late, and are unable to quantify and qualify the effect of management tools upon their operational processes.

But those companies that do recognize the value, tend to focus on multiple results, such as increased efficiencies from process automation, business capabilities preserved

through ongoing risk reduction, optimized service levels that map to IT deliverables, and the enablement of new service level delivery mechanisms. By constructing the appropriate metrics to capture the "current state" of these areas, organizations can effectively realize and measure the impact of enterprise management technology.

Companies that focus on efficiency metrics (e.g., reduction of long-term unit cost), effectiveness metrics (e.g., reduction of overall IT complexity),

BMC Software Honors IT Leaders

In the competitive enterprise market, IT professionals must seamlessly link business and technology strategies in order to maximize their companies' productivity and profitability. The 1999 Best Practices in Enterprise Management Award program recognizes those IT leaders who have delivered bottom-line benefits through the successful implementation of BMC Software's COMMAND/POST. The COMMAND/POST family of solutions provides end-to-end, service-level management for ensuring availability to complex, crossplatform applications throughout the enterprise.

BMC Software customers worldwide participated in the third annual event, cosponsored by *Computerworld*, the newspaper for IT leaders. Several winners of this year's awards are profiled on the following pages and include:

- Lifetime Achievement Awards: BACS Limited and Ontario Hydro Services Co.;
- Gold Award: Siemens;
- Silver Awards: Allfirst Financial Inc., Bank of America and Worldspan.

The winners' success stories represent business and technology practices from which all IT professionals can learn. And although those honored exemplify outstanding achievement in their markets, many other IT professionals are realizing business and IT efficiency through BMC Software solutions. The following comments summarize what some of this year's entrants in BMC Software's Best Practices

in Enterprise Management Awards program are saying about their COMMAND/POST implementations.

BANK OF AMERICA

Bank of America, with \$618 billion in assets, is the largest bank in the U.S.; the firm's international Data Centre is responsible for the electronic transfer of billions of U.S. dollars daily.

"Our objective was to achieve a return on investment in COMMAND/POST within three years. We more than achieved it in one year."

—Mervyn Gutteridge, senior vice president,
Bank of America, International (Surrey, England)

and business alignment (e.g., degree of technology leadership in strategic technologies) are those that stand ahead of the pack.

In addition to selecting technology that has the correct "function fit," remember that much of the role of management technology is to automate existing management processes. Mapping tools to the existing processes should be what drives a company's product selection and assessment.

Companies introducing enterprise management technology into their operational



Companies
that focus on
efficiency metrics
are those that
stand ahead of
the pack.

-- Herb VanHook, META Group

processes as purely an automation vehicle, often find themselves doing extensive tool configuration and customization to meet their requirements. Therefore, an enterprise solution that has a flexible and adaptable nature is usually the wiser choice. It certainly enables the company to avoid the hurdle of "managing the management tool" and, instead, adopt the "managing their environment" position.

How do companies ensure that they have indeed adopted the most suitable management tool? Metrics remain the best safeguard: Perform a quick "time to value" and optimal return on investment analysis.

And still, there are unpredictable pitfalls that may derail an implementation of management strategies, such as personnel resources and missing skill sets. But the actual capabilities of selected management tools should be a known entity. Successful implementation of enterprise management tools requires appropriate expectation levels from the outset, followed by careful management—and measurement—of the project to those levels.

Herb VanHook is vice president and director of service management strategies for META Group Inc. in Stamford, CT. He has more than 25 years of experience in information systems, encompassing a broad technical background, with a focus on systems management issues.

CONXUS COMMUNICATIONS

As a provider of wireless two-way narrowband PCS services in the U.S., Conxus focuses on conventional paging services, voice mail, mobile users and the consumer mass market.

"COMMAND/POST is playing a vital role in providing network alarms with a minimal staff, allowing CONXUS personnel to quickly and effectively resolve problems." — Glyn A. Stanley, project manager, network management systems, CONXUS (Greenville, SC)

CREDIT SUISSE FIRST BOSTON CORP.

Supporting international, regional, and local banks on the stock market, Credit Suisse funds new businesses and serves as an investment advisor to large organizations.

"The BMC implementation has improved the relationship between the business and IT units. Users became more confident using our group for guidance, and they were impressed with the solution." — John Garfield, AVP communications software (Princeton, NJ)

PUBLIC SERVICE ENERGY & GAS COMPANY (PSE&G)

New Jersey's oldest and largest publicly owned utility, PSE&G serves a 2,600-square-mile area and 2.2 million people.

"Without COMMAND/POST, there would have been a significantly larger stoff and multiple managers required to merge network and computer operations. ...The [IT department] is now considered an asset to the business." — Jack Williams, project manager (Newark, NJ)

WORLDSPAN

Major airlines, travel agents, and Web sites rely upon Worldspan to book travel reservations electronically. Its worldwide customerbase totals 17,900 sites.

**The overall perception by customers, both internal and external, is that we are 'in control.' Prior to the COMMAND/POST implementation, the time for IT problem notification was anywhere from 15 to 45 minutes. As a result of the acquired automation, the process now averages 5 minutes." — David Anderson, Communications Coverage & Automation supervisor (Hapeville, GA)

UNLOCKING THE SECRETS OF ENTERPRISE MANAGEMENT SUCCESS

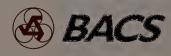
Electronic Funds Clearing House Sees ROI within One Year of Implementation

In the fast-paced world of banking, every minute of systems downtime can cost a financial institution millions of dollars.

That's why U.K.-based BACS Ltd., one of the world's largest automated clearing houses (ACH) of electronic payments, relies on BMC Software's COMMAND/POST enterprise management software to monitor applications and business services, and keep them up and running.

"We recouped the return on capital investment in COMMAND/POST within a year of implementation," says Rodney Inch, who manages all of the firm's operational services as head of BACS' Service Delivery. "The rapid ROI is directly attributable to the economies of scale made possible with this technology in rationalizing the operational infrastructure."

BACS, a \$64-million turnover ACH owned by 16 "members," comprising British banks and building societies, handles almost three billion electronic payment transactions from some 40,000 U.K.-based companies. It also manages the transfer of more than two billion check transactions between participating members. BACS' primary customers are its



Lifetime Achievement Award Winner



"The rapid ROI is directly attributable to the economies of scale made possible with this technology in rationalizing the operational infrastructure."

 Rodney Inch, Head of Service Delivery, BACS

shareholding banks, building societies and their customers. "Chances are that if you're employed in the U.K., your salary is paid into your

bank account via the BACS Electronic Funds Transfer—EFT service," says Inch.

BACS competes in a thriving arena. Inch projects that the U.K.-based non-cash payments marketplace will grow to 16.5 billion payments by 2008, compared with 11.1 billion payments in 1998. To maintain his firm's competitive edge, Inch's Service Delivery division must cost efficiently monitor all applications, servers and the network, both LAN and WAN based, to ensure that agreed service levels (SLAs) are continually met on a daily basis.

46 MILLION AUTOMATED PAYMENTS ON PEAK DAY

Administering such applications and file services successfully depends on a number of variables, such as operating platforms, applications, processes, transaction volume and network traffic—the latter of which changes daily, weekly or with business cycles and peaks to significant proportions at month end. BACS has now processed and cleared nearly 46 million automated payments on a peak day, and this peak is likely to exceed 50 million payments by

the end of this millennium.

In BACS' case, the applications run on an assortment of computing platforms. For example, a front-end

application called BACSTEL captures information via telecomms and feeds it into the main electronic funds transfer (EFT) application for processing. The EFT system, which runs on ICL Trimetra-SY multi-node mainframes, supports the clearing of both Sterling and Euro payments.

Banks and customers interact with several other BACS applications, including a direct debit amendment-and-cancellation application called ADDACS, check data transfer via a service called Inter Bank Data Exchange (IBDE) and a member-to-supplier EDI automation via a service called REMIT.

BACS also archives EFT service transaction data for seven years, during which time BACS' members need to have access to it. The information is stored on optical recording media running on a DEC VAX/VMS platform. Compaq Tandem S7000 multiprocessor systems operate the telecommunications input to the EFT system as well as REMIT and ADDACS services. Multiple configurations of IBM RS6000 UNIX servers handle the IBDE network.

COMMAND/POST manages the enterprise and provides the end-to-end business views, and Tivoli NetView monitors the network traffic as well as gateways and routers on the corporate WAN. The information from Tivoli is fed into COMMAND/POST to give a single, graphical display of the whole environment.

CROSS-PLATFORM ARENA

After evaluating several enterprise management solutions, BACS chose COMMAND/POST because of its ability to track service level performance across its many technology platforms. "Our business has critical

deadlines we must meet each day. We need a global view of the movement of traffic across the computing environment," says Inch. "In the past, all applications ran in a single mainframe environment. Now, applications are on disparate platforms, and monitoring the systems is not as simple as it used to be."

BMC Software's professional services assisted the BACS staff in the implementation of COMMAND/POST, with the project commencing in December 1995. By April 1996 (four months later), they had rolled out the solution into the operations

Despite the challenges
BACS' IT environment posed,
command/post provided the
flexibility to manage its
systems and meet the service
levels its customers expect.

Rodney Inch, Head of BACS
 Service Delivery

environment, and, as soon as June of the same year, BACS began making the organizational changes that had become possible with the new solution and service focus.

BACS users became productive quickly using COMMAND/POST, says Inch. Other organizational changes involved merging two operational areas into one to match the company's move to centralized management of all services.

A major technological change like the one BACS deployed presents a host of technical challenges. One of those was to connect BACS' ICLbased Job Scheduling System (JCS) to COMMAND/POST. BACS required the link to be able to monitor, manage and report system events and provide automatic operator responses. BMC provided a solution that emulated ICL protocols and integrated them into COMMAND/POST, which "fully monitors the JCS for system and application events, raises alerts and automatically invokes the necessary operator response," says Inch.

BACS also had to have integration between their internal help-desk system and COMMAND/POST for automatic trouble-ticketing and problem escalation. Now, systems events are automatically logged to the help desk and a trouble ticket generated, with the

resulting trouble-ticket number returned to COMMAND/POST without the need for manual involvement. In addition, BACS has used COMMAND/POST to automatically retrieve customer data from the BACS optical storage service and deliver the information to an internal intranet Web server for end-user access.

Despite all the challenges that the BACS environment posed, COMMAND/POST provided BACS with the flexibility to manage its systems to meet the service lev-

els to which BACS and its customers have agreed. In fact, Inch is so sure of this technology solution that he states that with full automation of all service and system components, it will help BACS enhance customer service as well as dramatically cut the cost of delivering those services, all with an end-to-end business process view.

And Inch is not finished. He plans to pursue additional benefits, including enhanced graphical views of systems, applications and network components. He also anticipates the ability to proactively manage SLAs. "There are more economies of scale that we will gain through further automation," he concludes.

UNLOCKING THE SECRETS OF ENTERPRISE MANAGEMENT SUCCESS

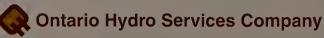
Ontario Hydro Saves \$1 Million and Sparks New Business with IT Plan

ing \$9 billion in 1998, Ontario
Hydro operates one of the largest electric utilities in North America. Forming a virtual web throughout the province, its transmission lines entwine a 29,000-kilometer grid and a 120,000-kilometer distribution system.

But the impending deregulation of the energy market in 2000 will change the dynamics of the utility business in Ontario. Customers will be able to buy electricity from one supplier and ship that electricity using the network of another supplier. And, like its new competitors to come, Ontario Hydro will be able to actively market all of its energy services to retail consumers and businesses located in adjoining states and provinces.

To respond to both the anticipated competition and new market opportunities resulting from deregulation, Ontario Hydro needed to reinvigorate its corporate infrastructure and its IT services.

As of April of this year, Ontario Hydro split into five companies. The three major ones include one to generate the power, one to manage the transmission and retail energy ser-



Lifetime Achievement Award Winner



"A conservative estimate is that early detection is saving 100 man-hours per day or \$1 million annually."

Aaron Cheng, Manager, Telecom
 Operations Group, Ontario Hydro
 Services Co.

vice businesses, and one to manage the buying and selling of electricity. Ontario Hydro Services Company (OHSC) is now the name of the energy services arm. During this transition, much of the IT and telecom infrastructure will be shared. The Telecom Operations Group currently manages this infrastructure. This group oversees several mission-critical systems, including the provincewide electricity grid and a corporate WAN that the business units rely on for day-to-day business processes, such as financial systems.

Ontario Hydro's IT infrastructure consists of a power protection communication system, a corporate voice network and a WAN that includes a corporate network of 330 Cisco routers connected through an AT&T frame relay service. In total, there are some 20,000 network nodes spread across 400 sites.

In the past, it took several operations centers to manage the diverse technologies. With the convergence of telecommunications and computing, the arrival of client/server applications and increasing competition in the industry, Ontario Hydro needed a more integrated system for IT services.

To meet that challenge, Ontario Hydro created an enterprise management center in November of 1994. The center was to be the focal point for the delivery of all management services by a single operations group. The enterprise management center, called the Information Technology Management Center

(ITMC), went into full operation in April of 1995.

When Ontario Hydro was evaluating management systems in 1994, it looked at five products. The company chose COMMAND/POST because "it had the needed flexibility to integrate with any piece of technology, whereas the other products were focused on SNMP-type systems," says Aaron Cheng, manager of the Telecom Operations Group. This capability was important because Ontario Hydro was trying to build a management system that could take care of many technologies, including microwave and voice systems. "We wanted something that was really open," adds Mark Fukuzawa, manager of the IT Management Center (ITMC).

COMMAND/POST AS THE HUB

COMMAND/POST from BMC Software is one of three anchors in ITMC's computer infrastructure. The other two are Remedy Systems' ARS (Action Request System), which provides a work management database to manage all IT service requests and problems, and HP Openview NNM for SNMP devices. COMMAND/POST is the integration point for events from all systems, including the legacy and proprietary systems. In addition, it filters and correlates events within the enterprise and automatically opens ARS trouble tickets.

Other management systems integrated with COMMAND/POST include Quindar's SCADA system, which is used for real-time alarm monitoring of microwave equipment, Netview/390, Switchview (PBXs) and a SONET management system. A voice response system (Edify) is integrated with ITMC systems to automate the process of cre-

ating trouble tickets reported directly by customers over the phone.

Fukuzawa calls COMMAND/POST "an enabler for the ITMC." Most importantly, the product provides the ITMC with the capability to manage a diverse set of technologies. The number of technologies managed by the ITMC rose from 18 in January 1996 to 40 in January 1999, while total operating cost of the ITMC only increased 17 percent in the same period. These cost savings were obtained

Ontario Hydro chose command/post because "it had the needed flexibility to integrate with any piece of technology..."

-- Aaron Cheng, Manager, Telecom Operations Group, Ontario Hydro Services Co.

as a direct result of automation of routine work. Also, new services can be added to the ITMC in very little time. For example, in the spring of 1998, a 1,000-node network was commissioned in only a month and a half.

The implementation of COMMAND/POST as an enterprise management solution has improved Telecom Operations' service delivery in four other ways:

(1) End-to-end, top-to-bottom management. Through the integration of network and systems management, the ITMC can view not only the infrastructure, but also the status of the applications. Having access to the entire enterprise, the ITMC can isolate all problems to the root cause.

(2) Automated service management. Today, the system records every

alarm received. ITMC staff then use their customized GUI interface to relate these alarms, pre-define severity levels based on SLA service impact, identify the most likely cause and record a procedural action response. This automation minimizes the time to correct problems.

(3) Satisfied customers. For the ITMC, quality means consistency. Every customer request received by the ITMC is followed up with a customer survey. Internal ITS customers

have expressed a significant improvement in service management, specifically having a single point of contact regarding any IT service issue.

(4) Rapid response time. Ontario Hydro employees are also noticing the benefit of improved response time to critical problems. Early detection of WAN component faults, for example, enables quick online correction of the fault or quick dispatch of technical staff to resolve the problem. "A conservative esti-

mate is that early detection is saving at least 100 man-hours per day or \$1 million annually," says Cheng.

The bottom-line benefit of the implementation is that the cost of operating the ITMC in 1997 was \$1 million less than would have been spent operating the historical management centers.

Throughout the implementation of COMMAND/POST, the ITMC has created a foundation that has ultimately lowered the cost of managing IT and telecom services, and will become increasingly cost effective as additional elements, systems and services are managed by the ITMC. Other benefits of the enterprise management system and its effects on overall service quality will continue to unfold.

Unlocking the Secrets of Enterprise Management Success

Automating IT Support Boosts Response Rate and Saves Siemens \$1.5 Million in Staffing

Siemens Group Austria recently faced what could be called an agreeable dilemma. As business more than doubled over the last two years, the \$4-billion IT services arm of Siemens AG wanted to provide top-notch technical support to its internal Siemens and external outsourcing customers. The hitch was that it wanted to do so without hiring additional support workers.

To meet its goal, Siemens deployed BMC Software's COMMAND/POST enterprise management software. "Because of the automation and escalation features of COMMAND/POST, we run first-level support at the control center with the same head-count," says Peter Mantuano, manager of Control Center in Siemens' competence center IT and networking (CCN) department in Vienna.

In fact, by eliminating the need for a third shift of workers as well as an additional person during the other two shifts, Siemens

SIEMENS

Gold Award Winner



"We continue to realize additional savings, and service levels and application availability continue to improve."

Peter Mantuano,
 Department Manager, CCN-CC,
 Siemens Group Austria

has saved some \$1.5 million on staffing alone since deploying COMMAND/POST in January 1997.

This translates into a return on investment within the first year. In addition, Siemens saves \$600,000 annually in staff costs. "We continue to realize additional savings," says Mantuano, "and service levels and application availability continue to improve."

CCN's customer-care service and help-desk call center employ some 20 staffers, who support a number of applications running on different hardware and networking platforms:

- Platforms supported include Siemens Nixdorf mainframes, as well as hardware from IBM, DEC, HP, Sun and Intel;
- Networks include Ethernet, Token-Ring, LAN, WAN, ATM and TCP/IP; and
- Supported operating systems include BS-2000, OS/390, OpenVMS, SINIX, HP-UX, Solaris, Banyan Vines, OS/2 and Windows NT and Windows 95.

INTEGRATING THE TOOLS

Mantuano's group uses a variety of network management and systems management tools,

which feed information into COMMAND/POST. The group's network management tools include HP OpenView NNM, Cisco Works, Cascade View, Strata View, Optivity and SCN-View. Systems management tools include ServerView, TransView, Live Network Integrator, HP-IT/Operations and Expose.

CCN supports all divisions and departments within Siemens Austria, as well as about 10 outsourcing customers from telecom, trade, transportation and insurance businesses. In all, CCN maintains more than 30,000 nodes and some 15,000 users. With 7,700 workers using SAP software, each hour that the application does not go down saves the company \$400,000.

"The worst-case scenario is that all 15,000 users cannot work," Mantuano notes. "Just the lost working time would be \$1.2 million per hour. And that's not calculating the loss with angry customers, lost deals and delays of projects."

Siemens chose COMMAND/POST to help it improve response time through a centralized, cross-platform escalation-management system. The IT provider also wanted to provide 99.8 percent end-to-end application availability (which works out to be about 17 hours of non-working time per year), or, as

- "command/Post beat out its competition because of its complete hardware and software platform independence."
 - Peter Mantuano,
 Department Manager, CCN-CC,
 Siemens Group Austria

Mantuano says, "at least to know an error or problem before the customer is aware of it."

MEETING THE CROSS-PLATFORM CRITERIA

COMMAND/POST beat out its competition because of its "complete hardware and software platform independence," says Mantuano. "All other vendors had (and still have) troubles with our wide range of platforms." In addition, CCN was able to use COMMAND/POST to integrate the network management tools that different IT departments use.

"COMMAND/POST is the focal point of our complete IT and communication system," says Mantuano. "It provides us centralized, distributed, customized views in any way

we need, to provide the best service and support."

CCN can slice and dice its supported environments in a variety of ways, including viewing hardware, applications, databases, departments, customers, networks, telephone and communications.

"COMMAND/POST is our single point of escalation to inform our first- or second-level support teams," says Mantuano. "We just have to

look after one solution and don't have to update escalation routines in hundreds of different tools."

COMMAND/POST's remote-access capabilities even enabled Siemens Austria's support staff to enjoy the company's traditional two-week Christmas vacation last year, without disrupting the 24 x 7 technical environment that CCN's customers require. "The first-level support had to come into the office only twice," says Mantuano. "The rest of the time they could enjoy their holidays at home like everyone else."

This custom supplement was created by

Computerworld Enterprise
Business Solutions. Comments
can be sent to editorial director
Ellen Fanning at (508) 820-8289 or via

email at ellen_fanning@cw.com. This

custom supplement, as well as other White Papers, can be viewed online at

www.computerworld.com.

Event Automation Maximizes Service, Staffing, Savings for Bank of America

ank of America, with assets of \$614 billion, is the largest U.S. bank and has an international network spanning 39 countries. The bank provides commercial and investment banking services to multinational, regional and major indigenous corporations, and to financial institutions and governments worldwide.

The Bank of America International Data Centre provides data-processing services to 10,000 staff members located in 37 countries, and it must ensure the movement of tens of billions of U.S. dollars daily through payment delivery systems.

The bank decided to move to an enterprise management environment to improve error handling and reduce system downtime through event management and automation. At the same time, the company was looking to consolidate operations platforms, in order to reduce the complexity of applications spanning multiple technologies, while providing a flexible infrastructure that would easily accommodate future business changes.

"At the Bank of America International Data Centre, our main challenge is to manage an increasingly complex set of integrated systems and applications, which are processing billions of dollars, to tight deadlines throughout the day and night," said Mervyn Gutteridge, senior vice president at Bank of America.

Bank of America

Silver Award Winner

Bank of America maintains a centrally controlled and very complex IT environment. Among the company's platforms are IBM and Amdahl mainframes running OS390 and VM; IBM AS/400; DEC Alpha and

"Our objective was to achieve an ROI in three years. We more than achieved it in one year."

-- Mervyn Gutteridge, Senior Vice President, Bank of America

VAX systems running OpenVMS; Compaq, HP, IBM and Sun Microsystems servers; and numerous PC and client/server applications.

PRODUCT & PARTNERSHIP

In the end, the company chose to implement COMMAND/POST from BMC Software. "The end products and vendors were selected on their ability to perform the tasks concerned, as well as for their ability to work with us as a true business partner, not merely as a software retailer," noted Gutteridge.

Bank of America has deemed the implementation a success. The company was able to reduce and reallocate the headcount dedicated to international service management by

some 20 percent over a three-year period, while at the same time nearly doubling its throughput. Bank of America saw a return on their initial investment within

the first year due to the headcount attrition alone, according to Gutteridge. In addition, any remote COMMAND/POST console is capable of monitoring or controlling all or part of the environment.

Customer-satisfaction surveys have shown improved performance, and, due to the lack of problems to report, the business community requested that monthly customer service level meetings be scaled back to a quarterly frequency. Technology "incidents" resulting in a financial loss have also been reduced by about 90 percent.

The outcome was that the front-line support staff enjoyed a significant increase in first level problem resolution. New responsibilities, such as Lotus Notes and NT administration, and logical security management, have been added. The overall result: Bank of America now has a true enterprise management environment, one based on a flexible, responsive service center with a focus on customer service and staff development that spans technology boundaries.

"Our development and deployment of advanced enterprise systems has given us the edge in providing and maintaining the highest quality service solutions in support of our businesses around the world," said Gutteridge.

High-Availability Solution Makes Web-Based Travel Smooth Sailing

s one of the top three providers of computerbased reservation systems used by major airlines and point-ofsale travel agents, Worldspan needed to ensure its system's uptime and rapid problem resolution to stay competitive.

Owned by affiliates of Delta Air Lines, Trans World Airlines and Northwest Airlines, Worldspan reported worldwide revenues of \$637.3 million in 1998. Worldspan is also the reservations Internet booking engine for many e-commerce sites, including Microsoft Expedia and Priceline com.

Worldspan's IT environment is centered around a real-time Transaction Processing Facility (TPF) host system and several IBM MVS and VM mainframes. The company employs several distributed systems to provide outside customers with access to the reservation data.

In the early '90s, Worldspan created the Communication Coverage and Automation (CCA) group to begin monitoring communications-related

issues and exploring solutions. By 1992, after evaluating products from a group of vendors, the CCA group chose COMMAND/POST from BMC Software. Worldspan officials say they started to realize the true power of COMMAND/POST by

WIRLDSPAN®

Silver Award Winner

1995, when they began using the product's database features to provide technicians with root cause analysis and event correlation. That same year, the company started using the COMMAND/POST system to make entries and run scripts for the verification and resolution of problems. Today, the system derives the root cause for the majority of troubles in the enterprise.

As a result of the COMMAND/POST implementation, the company's business processes have changed dramatically. The majority of the company's network trouble tickets are now generated via system alerts filtered and processed by COMMAND/POST, with real-time updates provided to outside trouble-ticketing systems. Before 1997, those types of clerical duties had to be performed manually.

Prior to deploying COMMAND/POST, numerous native consoles had to be

"BMC Software gave us a vehicle to correlate multiple events and identify the root cause, resulting in timely problem resolution."

David L. Anderson,Communications Coverage andAutomation Supervisor, Worldspan

monitored for system performance. Today, a consolidated console greatly reduces that workload, allowing the systems administrators to focus on solving performance issues. In addition, there is now less need to involve the help desk in known network problems. Furthermore, the number of supported remote sites per technician has increased from 150 to 500 over the life of the project.

According to David L. Anderson, Communications Coverage and Automation supervisor at Worldspan, "BMC Software has provided Worldspan with a solution that enables us to manage network problems effectively. They've given us a vehicle to correlate multiple events and identifying the root cause, resulting in timely problem resolution for our customers."

Anderson adds, "When all factors are included, we have achieved more customer accounts per technician, lowered the mean time to repair from 446 minutes to 123 minutes per trouble-ticket average, improved customer satisfaction, trended data for hard-to-find prob-

lems and achieved proactive notification to help desks, allowing network technicians time to work the actual problem. Most importantly, we are now able to identify large-scale outages before the contracted network providers do."



Resourceful.

DISCOVERING NEW WAYS TO ACHIEVE COMPETITIVE ADVANTAGE.

In today's rapidly evolving business environments, your operations can never be too efficient. To stay ahead of the competition, you need to leverage every resource to its fullest potential.

For more than 18 years, the world's most innovative companies have trusted BMC Software to help them gain maximum business advantage. By making the most of their critical IT resources, we've been able to turn technical challenges into opportunities – and transform cost centers into engines of profit.

Our customers know that BMC Software has the enterprise experience, technical know-how and world-class service to keep them at the forefront of business innovation.

From e-business to data warehousing, BMC Software has the solutions to ensure that all your critical resources operate at peak efficiency and availability. So you can turn existing resources into powerful competitive advantages – and achieve your business potential.

800 408 4810 | www.bmc.com/info



Assuring Business Availability

NEWSOPINION

a company's data privacy policies, you don't think it does you any harm.

But suddenly a high-profile and respected privacy advocacy organization such as the Electronic Frontier Foundation begins to use the Third Voice program. It systematically gives pass/fail grades to all Web sites, and you fail miserably. Your own Web site now says you are a privacy

Soon, all sorts of groups could be damning or praising you. Such is the unprecedented power of the Web. Third Voice is just the beginning. Every business, no matter how small, will acquire a reputation accessible to anyone in the world on the Web.

So ask yourself: If all those who deal with your company could gather every day and discuss what value you provide to them, what would they say? As the Cisco Systems television commercial asks: Are you ready?

DAVID MOSCHELLA

A 'new economy'? Don't believe it for a second

E PROBABLY all have buzzwords we wish would go away. Some people can't help rolling their eyes at the mere mention of paradigm shift; others are fed up with overused gerunds such as re-engineering, reinventing and, of course, the twin towers of business babble — thinking out of the box and pushing the envelope. While



DAVID MOSCHELLA is an author, independent consultant and weekly columnist for Computerworld. Contact him at dmoschella@earthlink.net.

all this jargon makes me wince too, my particular pet peeve is the new economy, which, despite all logical odds, continues to gain acceptance among technologists, policy-makers, the media and, most depressingly, reputable economists.

To me, the increasingly widespread be-

lief that we have entered some sort of special age is the surest sign that economic success is going to our heads.

In a sense, the U.S. economy is always new, since it's always in a continual state of change. But the phrase new economy is never used this way. Inevitably, the term is contrasted with some imagined "old economy," as if all of our past were just one hopelessly plodding, obsolete and evolu-

tionary dead end. New is networked and virtual; old is hierarchical and rigid, blah, blah, blah.

But when did this old economy actually exist? Was it five, 50 or 500 years ago? Is the difference between the 1980s and the 1990s really all that much greater than the difference between the '20s and the '30s, the '40s and the '50s, or even the '60s and the '70s? Or were all of these "new economies," too? And, while we're at it, how long can a new economy manage to remain new?

As imprecise as the term may be, it is even more unnecessary. Most of what people mean by the phrase new economy could be expressed just as well as digital economy, information economy, virtual economy, network economy, or any of a dozen other _____ economy contenders. You'd think that, because information technology is the fundamental economic driver of our times it would deserve top billing, but there are at least two groups who think otherwise.

First, people counting on ever-higher stock prices are, understandably, attracted to the idea that economic fundamentals such as business cycles and price/earnings ratios might somehow have become obsolete. Faith in a "new economy" allows them to dismiss the naysayers who "just

don't get" the fact that the old rules are no longer valid. But what amazes me is how many informed people seem to have forgotten that, just 10 years ago, many "experts" were saying that Japan had rewritten the rules of the global economy and that it, too, was immune from old-style problems.

Then there is a second group of Net enthusiasts who take it as gospel that the Web is destined to revolutionize everything — business, government, education, entertainment and more. To these true believers, building a new economy is just a minor, and not particularly interesting, aspect of building a new society. Never mind all the other great inventions we have lived through in this century alone.

Don't get me wrong. We are clearly in a major period of growth and change, but such periods are as much the rule as the exception. Steam, steel, railroads, oil, electricity, automobiles, airplanes, telephones and televisions have all expanded and transformed U.S. society. No doubt, during each era it often felt like a new economy was being born. But history has clearly proved otherwise. We all like to feel that we are living in special times, but they are special only to us. •

READERS' LETTERS

Porn Web sites not a good example

was very disturbed that Cynthia Morgan would recommend, apparently with a straight face, that businesses follow the marketing practices of sex sites ["Porn Paves the Way for Web Site Profits," Technology, Aug. 30].

Sex sites have no special talents in constructing Web pages. Instead, they make money through the systematic exploitation of women and young people in general.

Computerworld has reached a new low in Cynthia Morgan's column.

Edward G. Nilges Chicago spinoza1111@yahoo.com

Linux reporting benefits readers

HAVE BEEN pleased with the manner in which your publication has reported on the

increasing use of Linux within the corporate world.

Your reporting has been fair and, I think, beneficial to the Linux community and to the wider IT community. You have consistently reported the benefits and drawbacks of Linux, and your take on that operating system is a welcome break from the much more rabid proand anti-Linux reporting one sees in your competition.

Ronald D. Morley Unix system administrator Gobles, Mich.

Show more images of women in IT

UCH has been said and written about women and IT: Why aren't there more of us in the industry, why aren't young women selecting IT as a career, why aren't women in the industry getting the "plum" assignments and projects?

I have seen articles on

women and IT in Computerworld throughout the years, but something has me puzzled: Why are there so few images of women in Computerworld (compared to images of men)?

I have been keeping score, and the latest issue is right on track with former issues: Images of men outnumber images of women about four to one consistently in *Computerworld*. It's no wonder women feel disenfranchised in the IT world.

C'mon, Computerworld, you can do better! I'll be expecting to see it in future issues.

Anne C. Landgraf
Business analyst/programmer
Datex-Ohmeda
Louisville, Colo.

Blame it on Y2K

ILLIAM Ulrich states in his column "Don't Be a Victim of Year 2000 Denial," [News Opinion, Sept. 6] that he believes there will be much underreporting of Y2K problems as the new

century dawns. I believe he is wrong.

After dealing with systems for more than 15 years, I've found that people will use whatever convenient excuse for failure is available. So whatever failure happens on or after Jan. 1, 2000, many people will be quick to declare a Y2K problem.

It doesn't matter if the problem is hardware failure or a software bug or a virus attack on computer systems or the car failing to start on Jan. 1 after sitting out in a 10-degree chill with a weak battery.

Wayne Richards Goodyear Tech Center Akron, Ohio wrichards@goodyear.com

computerworLD welcomes comments from its readers.
Letters shouldn't exceed 200 words and should be addressed to Allan E. Alter, columns editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701.
Fax: (508) 875-8931; Internet: letters@computerworld.com. Include an address and phone number for immediate verification.



Try getting this out of your plain vanilla black-and-white printer or copier.

imageCLASS™ (2100

Call 1-800-OK-CANON, or visit us at www.usa.canon.com



You can stand in front of your black-and-white copier all day long and never get it to output

in color. You can stand in front of your color printer and never get it to deliver the

B+W Color All of the above

laser crisp text of a black-and-white machine. But, walk up to Canon's new

imageCLASS C2100 printer, and you get both. Or, maybe you'd prefer to sit. After all, the imageCLASS C2100.

works from your desktop, too. HERE'S THE FUTURE. LET'S GET TO WORK.™



NEWSOPINION

KEVIN FOGARTY

9/9/99 panic offers a hint of what's to come

few weeks ago, *Computerworld*'s offices were crowded with TV news crews interviewing various reporters and editors about the date.

It was Sept. 9, remember, and the string 9/9/99 was supposed to set off some chain of catastrophes as computers around the world recognized it as an ancient process-shutdown code that mainframers used to use.

The most significant result of the date string – except to put a few more *Computerworlders* on TV trying to calm the masses — was massive



KEVIN FOGARTY is Computerworld's business editor. Contact him at kevin_fogarty@ computerworld.com.

celebration in Thailand, where nine is a lucky number. The four nines in the date string set off a riot of weddings, business openings and requests for Caesarean sections by pregnant women who wanted their children born on a lucky day.

One more potential date disaster safely passed, eh?

All indications are that corporate America has been hard at work on the

Y2K problem since at least 1995. (Hard at work in this case means "aware and worried" from 1995 to mid-1997, then "frantically busy at emergency remediation" from then on.)

Most of that work has gone into making sure that a huge potential disaster doesn't turn into a huge real disaster.

Now the Senate Special Committee on the Year 2000 Technology Problem is warning citizens and government agencies not to panic, thereby doing everything Congress can to ensure panic. And U.S. Y2K czar John Koskinen has publicly worried that Americans are becoming complacent about Y2K and recommends that we keep three days of supplies on hand.

Don't panic? My ATM has a banner on it reassuring me that it's Y2K-compatible. Grocery stores, credit cards, even gas stations are displaying Y2K warnings and assurances.

Is this Y2K mania nuts? Potentially.

Federal Reserve Chairman Alan Greenspan warns that if everyone who's vaguely worried about Y2K goes out and prepares for a disaster, we're going to have a nationwide rush that will eat up, then waste, both time and resources.

Ever seen the line that forms in a grocery store as people stock up on milk and bread to weather a big blizzard that's never quite the disaster we expected? Multiply that a hundredfold and apply it to states down South as well as in chillier climates. What should you do?

Tell your friends, relatives — heck, anyone who will listen — that there are computer glitches all the time, and people live through them. Tell them 75% of companies report they have already encountered Y2K problems and have found fixes or work-arounds.

Tell them the power goes out in some places every winter, and it has nothing to do with computers. Tell them to just call their bank or credit-card company to get inevitable errors corrected. It'll be inconvenient, but the companies they deal with know about Y2K, and most are ready to deal with problems.

Tell everyone to take a few reasonable precautions. Tell them to keep paper copies of their bank records; tell them to double-check their credit-card and phone bills to make sure there are no typos or miscalculations. ("Who was talking on the phone long distance to her boyfriend since 1900?")

Tell everyone to just calm down. It'll be OK. Then hire a few extra bodies to beef up your customer-support help desk. Year 2000 may not be a disaster, but it will certainly be a pain.

JOHN GANTZ

Consulting firms are the models for IT departments

T THE Fortune CIO conference in Santa Fe, N.M., last summer, I heard lots of talk about "aligning"

IT" to the "new business models" spawned by the Web. I heard it again last week at a European IT conference — only in different accents.

But what does it mean? What exactly is a business model anyway? And how do you "align" with it?

To me the term "new business models" generally means old-line companies trying to emulate success-

ful start-ups by cutting out middlemen in the supply chain or running with fewer employees. Usually, changing business models means swapping out older executives for newer ones and laying off the rank and file.

For IT departments, "aligning" with new business models means committing to getting projects done faster, paying more attention to end users and doing it all with smaller budgets.

This is all real stuff. IT departments really *are* being asked to organize themselves differently. I

want to share some ideas on how to do so, which I've been bouncing off the CIOs I've been meeting lately.

Because you will be competing for resources and projects with outsourcing firms, I propose you organize your operation like a consulting company or professional services firm. Running a help desk or managing a Windows 2000 upgrade isn't going to save your company — but automating a call center, getting an e-commerce site up and running or developing Dell-like personalized customer-support Web pages might.

I think you need the following in this new incarnation:

- Deadline-driven project managers. Most programmers I know are into the challenge of programming not finishing projects on time. Many don't even know how much time the tasks they have previously done take. Better to have a project whip than a technical guru in charge. These are called "engagement managers" in the professional services world, and their major responsibility is to their clients.
- Development teams organized by company department, not technology. These are your "practice areas."

 One team supporting manufacturing, another supporting finance and so on. After a while, these teams will develop an affinity and loyalty to their end-user group. They can begin to be proactive about implementing technology that helps the business. You should even think about hiring into your group from those end-user departments. Consulting firms hire from their clients all the time.
- Time accounting. This may seem odious to your staff, but all respectable consulting and professional service firms bill by the hour. The system doesn't have to be complex, and you don't have to use it for chargebacks. But you will need an experience base in order to do a top-notch job of project estimating and costing. And project estimating is an important skill for any professional services organization.
- Training in the business units. Domino's Pizza, for instance, sends all new IT employees out into the field to see how pizzas are made, how the retail and delivery operations are run, how supplies are ordered and so on. Your people need to know what business you're in, and they need to feel like they're a part of it.
- Savvy human resources management. You have to recruit and retain employees. For more on this, see my Aug. 30 Computerworld column.
- but most good IT departments work very hard on communicating inside their companies. I say formalize it and hire someone whose job it is to evangelize IT inside the company. Dell Computer's online division, for instance, has marketing specialists who go around inside the company, extolling the virtues of Web technology to the different business units and product lines.

Operate IT like you're a key third-party supplier to your own company, and you will automatically "align" yourself to your company's business model. You'll have to, to keep the business.



JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at jgantz@idcresearch.com.

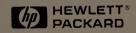


The world's largest conference on Oracle e-business solutions with more than 500 technical, keynote, educational, and hands-on sessions.

Los Angeles Convention Center November 14–18, 1999 REGISTER EARLY AND SAVE Call 888.347.6448 www.oracle.com/openworld

Oracle OpenWorld® is sponsored by Oracle Corporation in cooperation with:









© 1999 Oracle Corporation. All rights reserved. Oracle and Oracle OpenWorld are registered trademarks of Oracle Corporation. Oracle OpenWorld is managed and operated by Oracle Corporation in cooperation with the International Oracle Users Group—Americas (IOUG-A). All other company names may be trademarks of their respective owners.

ORACLE

They needed
data. They needed
technology.
What decision
makers need
now is...





The SAS® Solution.

The way to make sense of it all.

Are your decision makers bombarded with too much data that has too little consistency? Looking for an infrastructure that puts them in control—turning chaos to order, and data into reliable and usable information?

The SAS Solution—from the leading name in data warehousing and decision support—makes it easy to:

Manage information and make it available to those who need it—regardless of how it was created or where it resides

Leverage your investments in people, resources, and technology

Reduce your backlog, simplify and automate processes, and reaffirm IT's business value throughout your enterprise

We're the knowledge company that combines business understanding with flexible, open, and end-to-end technologies that drive your business forward. Get to know us by requesting our free CD, *The SAS® Data Warehousing Solution: From Chaos to Order, from Data to Knowledge* at www.sas.com/makesense

The Business of Better Decision Making

BUSINESS

GIVING AWAY The Store

Good Web sites draw in customers with case studies, product data and other information that's valuable to them — and invaluable to competitors. Spies can reverse-engineer that information and find out enough about your plans to beat you to the market niche you're planning to fill. 62

SURVIVING FLOYD

Customer service giant Convergys Systems scrambled to re-create its mission-critical operations in safe areas after its Jacksonville, Fla., facility was threatened by Hurricane Floyd earlier this month. Jacksonville was spared, but analysts called the company's disaster recovery effort effective and well thought out. • 49

Y2K CONFIDENCE

Computerworld's penultimate quarterly survey on confidence about Y2K problems found IT managers more optimistic than ever about their preparations as well as those of their partners. But insurance companies are bracing for a tide of requests for paper records. • 47

REAL VALUE

Dot.com companies draw huge stock prices on Wall Street but can also show traditional companies how IT can add value, if CEOs understand how vital IT is to horizontal integration efforts, Jim Champy advises. • 52

RESERVATION MIGRATIONS

For hotel reservation systems, downtime is like death. Carlson Hospitality increased revenue and saved time with a new system but kept its homegrown app plugged in — just in case. • 42

TECHNO-MBAS

Programs are springing up like weeds, but no traditional MBA programs made the top 25 in a Computerworld survey. Top techno-MBAs are solid technologists with good communications and business skills, not number-crunching theoreticians. • 56

WORTH HIRING?

Techno-MBAs with the right mix of business, technology and communication skills bring a lot to the table and tend to stay on longer than generic MBAs, IT managers say. But they also command top dollars. • 61

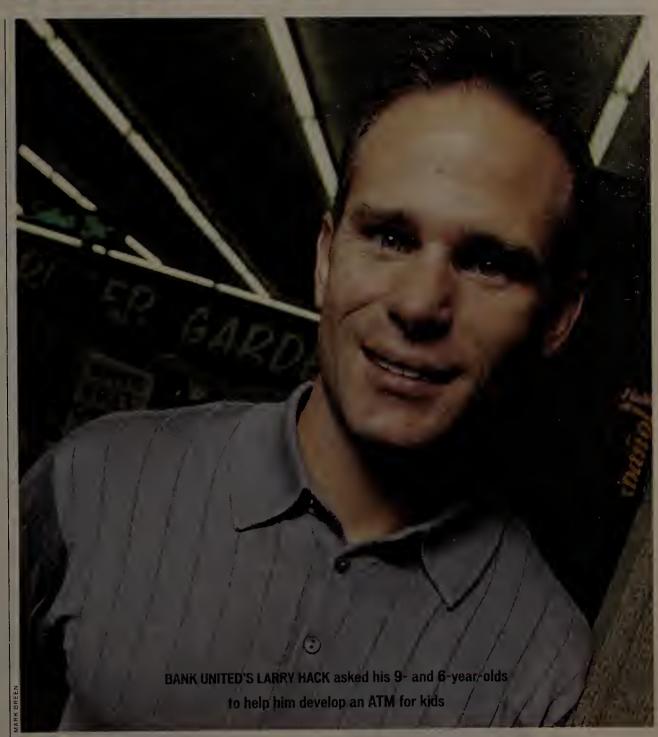
BEST EFFORT?

Beware of the term best effort in IT contracts,
Joe Auer warns. It's better to set a specific goal than to trust a vendor's definition of what that means. • 63

JOCKEY INTL.

A nice, conservative place to work, despite the half-naked people on the walls. • 52

MORE	
Advice	66
Careers	
Opinion: Jim Champy	52
Year 2000	47



THE PIED PIPER OF BANKING

BANK UNITED IS TRYING to earn the loyalty of customers as young as 5 by installing Kids Talking Machines — KTMs — near ATMs in Dallas-area grocery stores. Kids can check their balances, budget for a special toy or plan how to be a millionaire. Return on investment is imprecise, but KTM developer Larry Hack says the low cost makes it worth the chance to lock in customers at a very early age.



YOU NO LONGER CONTROL YOUR COMPANY.
YOUR CUSTOMERS HAVE TAKEN OVER.

Your eCommerce customers demand the convenience of a 24-hour mini-mart and the personal service of an old-fashioned general store. Any company can take orders over the Internet. The question is, how well are you really serving your online customers? Extremely well, if you use PeopleSoft eStore, because only eStore integrates seamlessly into your ERP system to deliver end-to-end business-to-business (B-to-B) and business-to-consumer (B-to-C) eCommerce solutions. You can give accurate delivery dotes, customer-specific pricing, real-time inventory availability—and turn first-time buyers into loyal, profitable, repeat customers. PeopleSoft eStore also gives your entire organization a 360 degree view of each customer relationship, no matter how they contact you. Whether it's through the Internet, phone, fax, or mail, your organization can respond. To find out more visit our website or give us a call.

Introducing PeopleSoft eStore

End-to-end eCommerce solutions for selling online

Single solution for B-to-B and B-to-C sales • 360° view of your customer relationships • Integrates with ERP System



Applications for eBusiness*

www.peoplesoft.com

888.773.8277

SAVE OVER 76%

YES! Please enter my subscription to Computerworld – I'll pay just \$48.00* for 51 weekly issues. That's a savings of over 76% off the single copy price.

TITLE

COMPANY

E-MAIL ADDRESS

ADDRESS

CITY STATE ZIP

*U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars. Address Shown:
Home Business New Renew Single copy price: \$4.00/issue B4CT9 L

COMPLITERWORLD

THE NEWSPAPER FOR IT LEADERS

	BUSINESS REPLY MAIL FIRST-CLASS MAIL PERMIT NO. 55B MARION OH POSTAGE WILL BE PAID BY ADDRESSEE COMPUTERWORLD PO BOX 2044 MARION OHIO 43306-2144	NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

Bank Aims Young With Kid ATMs

Bank plans to educate young consumers

— and perhaps win future customers

BY JULIA KING

orget baby boomers and twentysomethings. Bank United is trolling for potential new customers among the Teletubbies/Pokémon crowd.

Since June, the \$15.7 billion Houston-based bank has deployed automatic teller machine (ATM) look-alikes called Kids Talking Machines (KTM) at 25 of its 50 branches located at Kroger Food Stores throughout the Dallas/Fort Worth area.

While their parents shop or conduct their bank business, kids can tap into the machines to check their own account balances, figure how much they need for a certain toy or even calculate how long it will take to become a millionaire.

"We wanted to provide an extra reason for shoppers to come by and bank at the Bank United branch in the [Kroger] stores," said Ron Coben, exec-

utive vice president of community banking. "We also thought that if we can get people started using Bank United as kids, there's no reason they'd not want to use us down the road," Coben said. Kids without accounts can still use the terminals for other functions.

Technology was the natural hook for a generation weaned on computerized play pals and video games. To develop the system, Larry Hack, vice president of emerging technology, enlisted the help of his own 6-and 9-year-olds.

"We wanted to make it simple because, with a target audience of 5- to 12-year-olds, some of these kids can't read," Hack noted. Remembering a personal identification number would also be difficult for younger children.

To get around those issues, telephone numbers are used as identification numbers. Passwords are a combination of

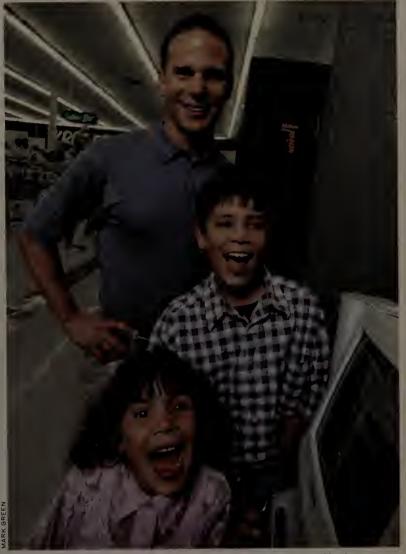
three out of four coloring-book images. Children receive wallet-size cards with their codes, which they enter into the system on a touch-screen display.

On the back end, the KTM system incorporates Microsoft Corp.'s Active Server Page and flash animation technologies plus a SQL Server database with stored procedures, which is tied to a central mainframe.

But it's the ID cards that are a big hit so far. "One of the most exciting features for my daughter is the fact that she could pull it out of her pocket and use it. It made her feel pretty important," Hack said.

Coben estimates the total cost of the KTM project is "the cost of a PC in each branch and of [Hack] working until 4 a.m. for several weeks." As for the bank's return on investment, "this is not one of those projects where you sit down and calculate very specific profit numbers but one of those things you know in your heart is the right thing to do."

Robert Landry, a retail banking analyst at TowerGroup in Needham, Mass., said he con-



TO DESIGN A "COOL AND INTERESTING" SYSTEM, Larry Hack got a younger perspective with input from his daughter and son

siders KTMs a worthwhile step toward educating younger consumers about the benefits of automated banking.

With the KTMs, Bank United is positioning itself as a progressive, innovative bank. It

also launched the first iris recognition ATMs at three sites in Texas earlier this year, Landry said. Using these machines, customers can withdraw cash from their accounts just by looking at the ATM.

Stored Images Help Build New Business

Digitizing old art pays off for GM, Liz Claiborne

BY DOMINIQUE DECKMYN

General Motors Corp.'s Media Archives Group in Detroit manages more than 3 million images of cars and other items going back more than 100 years and handles thousands of hours of video. With the help of digital media asset management software, the company is leveraging its image archive across multiple media and making images more accessible.

GM digitized part of its archive about six years ago, but it wanted an Internet-enabled system so that it could give direct access to advertising companies and other partners. The automaker also wanted to allow video to be retrieved remotely by end users, rather than by the Media Archive Group's 30 librarians.

Giving companies direct access also makes it easier to

reuse logos and images consistently in several media, including the Web, print and television, said Tom Freiman, manager of GM's media archives.

GM will manage its image archives with Teams, a browser-based application from Ar-



NOW THAT ITS DIGITAL IMAGES are available to outside firms, General Motors can more consistently reinforce its brand image

tesia Technologies Inc. in Washington. The system will be operational by year's end. Teams runs on Windows NT and Solaris and costs \$75,000 per server. A lower-priced departmental version of the software will be launched next month.

Jeremy Schwartz, an analyst at Forrester Research Inc. in Cambridge, Mass., said GM is one of a small but growing number of companies that is discovering the value of using its digital assets to reinforce its brand image on the Internet and elsewhere, and is buying tools to manage them.

Other tool vendors in this market include The Bulldog Group Inc. in Toronto and WebWare Corp. in Sausalito, Calif.

"Once you have the technologies in place, you can take a step back [and] start to mine these [digital] assets from a commercial point of view," said Schwartz.

A year ago, New York-based Liz Claiborne Inc. installed digital media asset management software from German software vendor Canto Software, which has offices in San Francisco. It was a \$15,000 investment that repaid itself in less than six months by lowering costs for retrieving images and improving reuse.

The purchase was "a nobrainer," according to Tim Mc-Manus, RAD/Macintosh system support administrator at Liz Claiborne. The system will also allow Liz Claiborne to shorten its publishing cycle for marketing materials by making digital pictures taken at its Manhattan photo studio available immediately on the Web so they can be viewed and approved. "We can have the photos approved or reshot in two hours," said McManus.

Upgrade? Sure. But Keep Old System, Just in Case

Hotel industry finds cold-turkey cutovers too risky for reservation system revamp

BY STACY COLLETT

HOTEL CHAIN can lose tens of thousands of dollars in revenue for every minute a reservation system is down, industry experts say. So most reservations centers would rather keep an old system than break in a new one.

"Once you've adopted a technology and paid the horrible price of assimilating it into your culture, you don't want to give up on it until you absolutely have to," said Steve Medina, director of application development for Carlson Hospitality Worldwide's international reservation call center in Omaha, which handles reservations for 500 Radisson, Regent International and Country Inns and Suites hotels.

But with calls to Carlson's reservation system reaching

130,000 per day, the system had reached the end of the road. After 13 years of upgrades and patches, the mainframe system, with homegrown applications written in a nearly extinct "Action" language, wasn't scalable enough to quickly update reservations around the globe or handle files with a million records on customer preferences.

So in 1996, Carlson waded into a four-year, \$15 million revamp of its reservation call center system. To reduce risk, the company took the expensive step of keeping the new system backward-compatible with its legacy system. The results, officials said, are less downtime, an easier training schedule and the ability to build confidence in the new technology.

To link the two systems, Carlson first traded its home-



CARLSON HOSPITALITY WORLDWIDE'S Steve Medina says keeping the legacy system online gave agents an alternative if the new system failed

grown, nonrelational database for an Oracle Corp. distributed database. Then the company programmed the legacy application and the new system to talk directly to the Oracle database using C++ development tools from Forte Soft-

ware Inc. in Oakland, Calif.

"At any time, people can fall back to the old system during the transition period," said Medina, who recalled a glitch that took the new reservation system down for five hours. Reservationists simply booted up the old system on the same terminal. "It's a much more controlled [situation]," he added.

There are cheaper ways to link old and new systems, according to Greg Nyberg, senior architect at Born Information Services Group in Minneapolis, which has helped Carlson and other hotels bridge old and new reservation systems. A method called "rapporting," where queries search the old database, rather than having reservationists connect directly with it, is half the cost of the direct-access method. But in the long run, "you are continuing to be dependent on the old system," Nyberg said.

Several hotel chains are opting for backward-compatibility as they upgrade systems, according to Richard Moore, an associate professor at Cornell University's School of Hotel Administration in Ithaca, N.Y. Hilton Hotel Corp., for example, just cut the cord on its old reservation system after making it backward-compatible with the new system.

About 50% of Carlson system users are on the new system, according to Medina, who said he expects Carlson to stay linked to its legacy system until they are trained and fully confident with the reservation system. According to Nyberg, that could take up to two years.

Trading Nets Group to Share Stock Prices

But nonbinding agreements could pose problems

BY THOMAS HOFFMAN

A plan devised by a group of eight electronic trading networks to share stock prices should be a big step in reassuring investors that they're getting the most accurate prices in the burgeoning after-hours trading landscape.

Still, skeptics said they're concerned that the nonbinding agreements might not always result in the best prices and wouldn't require electronic trading networks to share stock prices with other networks.

The nonbinding agreement was reached two weeks ago by the electronic communica-

tions networks (ECN) such as Instinet Corp. and Island ECN Inc., both based in New York. ECNs are alternative trading systems where investors can buy or sell stocks outside of a traditional stock market, such as the New York Stock Exchange.

Under the plan, an ECN such as Island could establish bilateral agreements with other ECNs to share the best "bid" or "ask" values of stock prices. As a result, an Island customer would have access to stock prices posted by competing ECNs, such as Archipelago LLC in New York.

Though most, if not all, of the eight ECNs involved in the agreement are planning to enter the after-hours trading fray in the next few months, so far only two — MarketXT Inc. and Island ECN — are currently offering stock trading outside the traditional 9:30 a.m. to 4 p.m. cycle.

While the technical requirements to make this work are considered fairly minor, skeptics are concerned that the nonbinding agreements could pose some problems. "Their prices and their [trading] activity are their competitive edge — who's to say these competitors will give each other the right price each time?" asked Bob Iati, an analyst at TowerGroup, a Needham, Mass.-based financial services consultant.

Regs on the Way?

To date, regulators such as the Securities and Exchange Commission haven't dictated how ECNs should operate, though Iati said he expects that to change within the next year as the alternative trading market blossoms.

Tradebook Super ECN, operated by Bloomberg LP in New York, "will let our customers see other ECNs' prices. We'll see how other ECNs react to that," said George Geyer, chief operating officer at Tradebook.

Geyer said the ECNs involved hadn't set a timetable for sharing stock prices, though he said the spirit of the agreement was "sooner rather than later." Because the bilateral agreements should require only point-to-point or T1 connections between the ECNs, "they could launch it as early as Nov. I if they so choose," said Iati.

Overall, Iati said, he believes the agreement is good for the exploding after-hours trading market, because price-sharing will likely lead to greater liquidity, or higher trading volumes and less market fragmentation.

JUST THE FACTS

Stock Traders Unite

What: Eight electronic communications networks that let investors buy and sell stocks outside of traditional stock markets have agreed to begin sharing stock prices.

Who: Participants include Instinet, Island ECN, Brute, Archipelago, Redibook, Tradebook, Strike and MarketXT.

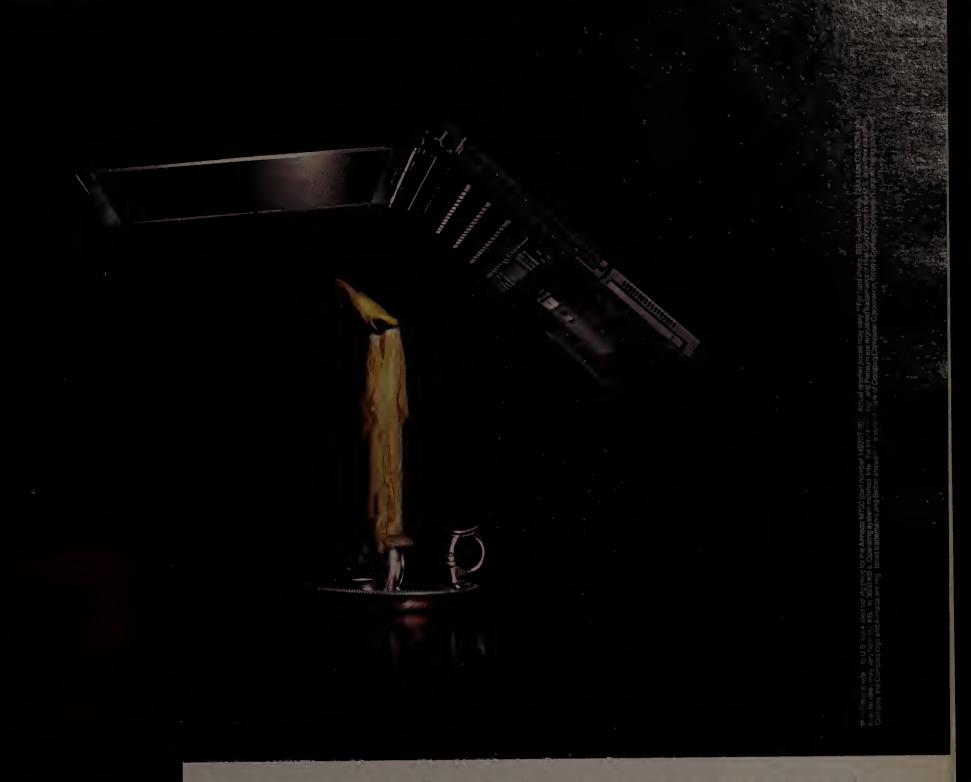
When: Although no deadlines have been set, data sharing could begin within a few

Pros: Ideally, investors will gain access to the best stock prices, even if they come from a competing trading network. The agreement should lead to higher trading volumes and better prices for investors.

Cons: Under the nonbinding agreement, networks don't have to share stock prices with competitors unless they agree to do so. Little, if any, regulatory supervision.

MOREONLINE

For books, articles and other resources related to online trading, visit our Web site. www.computerworld.com/more



Nimble?

Yes, and quick. In fact, the brand-new Compaq Armada M700 can perform all kinds of amazing feats. For starters, it's designed to be both powerful and mobile. With a choice of the latest Intel® Mobile Pentium® II processors and full Multibay, a generous 14.1-inch TFT display and AGP 2X graphics. And it's all contained in a sleek design

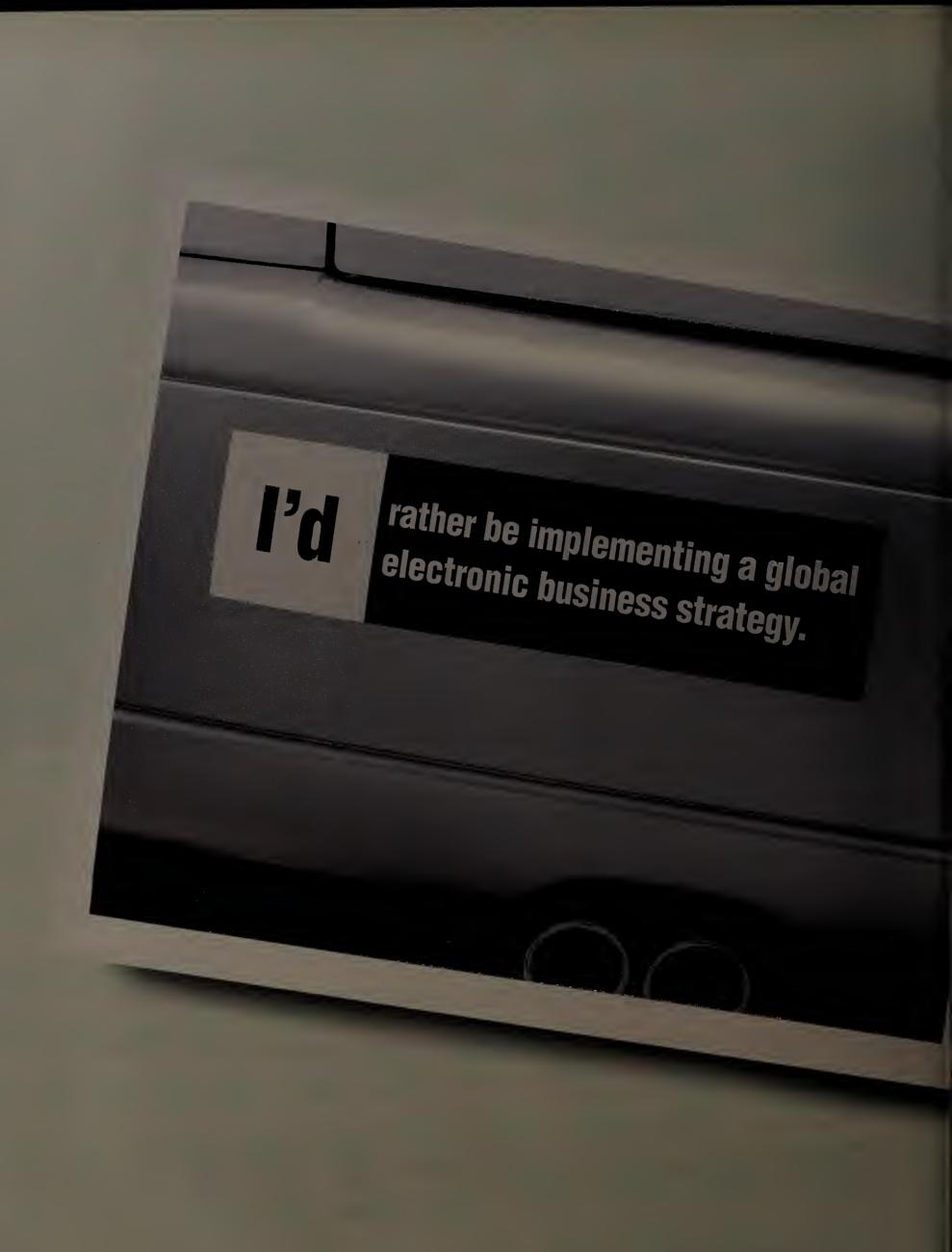
that's as light as 4.8 pounds and measures just 1.1 inch thin. It even supports new common docking solutions, making it a legendary investment for your enterprise. Call 1-800-AT-COMPAQ. Or visit www.compaq.com/armada. And discover why, candlesticks aside, the new Armada M700 is the closest thing to poetry in motion.

COMPAQ Better answers."

Armada M700 Series starting at \$3,299°

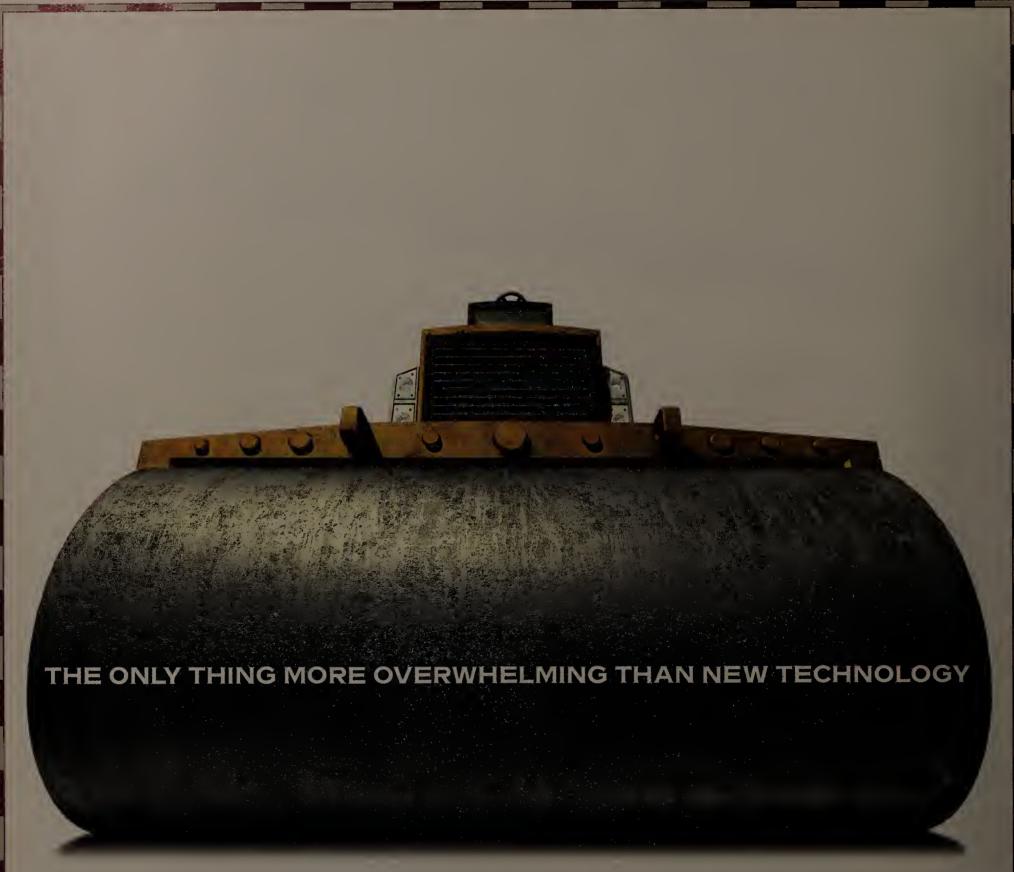
• Intel® Mobile Pentium® II processor 366 MHz • 6.4 GB** SMART Hard Drive

• 64 MB SDRAM (expandable to 288) • 14.1" (1024x768) color TFT display • 24X Max CD-ROM' • 3-year worldwide limited warranty





Need an e-commerce strategy to take your business global? Want to service your customers on-line? Want to web-enable your existing infrastructure? Want to integrate your supply chain? There's nothing we'd rather be doing. Call 800-566-9337 to learn more about EDS, or check our website.



IS HOW FAST YOU HAVE TO TRAIN PEOPLE ON IT.

For most people, the hardest part of implementing new technology is getting people trained. In fact, according to the American Society of Training and Development, the pace of technological change causes the top three problems in training today.

Which is why New Horizons Computer Learning Centers have created flexible classes and training options for everyone from beginners to network administrators. We offer more desktop and technical classes than anyone in the industry—training is available in our classrooms, on your site, on CD-ROM and on the Web. And our help desk is available 24 hours, 365 days a year.

To see how our guaranteed training can help you train all your people quickly, call

1 800 PC LEARN, ext. 106 or visit www.newhorizons.com anytime.



New Y2K Hurdle: Insurers Should 'Put It in Writing'

Firms plan for end-of-year spike in customer inquiries

BY DOMINIQUE DECKMYN

AVING TACKLED the year 2000 bug, some insurance companies are starting to gear up for what they expect will be a spike in demand from their customers looking for support and

documentation of their policies.

"We are anticipating that customers may want to have something in their hands," said Linda Mitrook, Y2K program manager at Aetna Financial Services Inc., a division of Aetna Inc. in Hartford, Conn. Based on its own research, the company is expecting a significant increase in calls from customers requesting hard copies of their policies and printed benefit statements.

The problem won't hit banks in the same way it will insurance companies because banks already regularly send detailed statements and can refer people to automated teller machines as an additional source of paper records, said Jayne Burke, a partner at the Global Risk Management Services group of PricewaterhouseCoopers in Boston.

Chuck Johnston, an analyst at Meta Group Inc. in Stamford, Conn., said it will mainly affect life insurance, annuities and mutual fund providers.

The Prudential Insurance Company of America in Newark, N.J., expects a rise in customer inquiries starting in November, with most requests coming in after Dec. 15, said Irene Dec, vice president and year 2000 program man-

ager at Prudential. The company has prepared an inventory of all statements it sends out to customers and is putting in place processes to locate documents quickly and get them out to inquiring customers. Prudential is also ready to beef up customer support, said Dec.

Aetna has opted for a two-pronged approach. The company in December will send all of its customers supplemental statements for pension plans, mutual funds, annuities and such. "This has already been factored into our Y2K budget," said Mitrook. She declined to provide cost estimates, but analysts say each statement sent costs up about a dollar. But the company has also increased customer service staff to deal with an expected rise in customer calls.

"It's part of the cost of doing business in 1999," said Aetna spokesman Tom Lindsay. Aetna also lets customers access their statements online.

On the other hand, Tom Towers, a spokesman for Northwestern Mutual Life Insurance Co. in Milwaukee, said the company is watching for an increase in customer calls but doesn't expect a significant change.

Survey: Year 2000 Confidence Soared Over the Summer

Managers see only minor blips ahead at turn of calendar

BY RICK SAIA

It's looking like a happy new year for information technology managers around the country.

Fewer than one in 10 IT managers contacted for Computerworld's most recent quarterly Y2K confidence survey believe the year 2000 problem will cause more than minor inconveniences. And the survey of 300 IT managers found that confidence in the compliance of their suppliers' and customers' systems soared during the summer.

"The sun will come up on Jan. 1," said a confident David Priest, information systems director at Charlevoix Area Hospital, a 50-bed facility serving three counties in northwest Michigan.

Other results include the following:

■ IT managers' confidence in the compliance of their partners jumped dramatically in the past three months. Asked to rate their confidence in their suppliers' and customers' compliance on a scale of 1 (not at all confident) to 5 (extremely confident), the mean answer was around 3.95, up sharply from about 3.3 in a previous survey in June. That number has been steadily rising in the past year. In October, the mean was at about 2.83, then rose to about 2.98 in March.

Clyde Duranceau, an information systems manager at Bellingham Cold Storage Co., in Bellingham, Wash., is among those whose faith in their supply chains increased. "We've received enough assurances from our suppliers," he said. "We're pretty well set." Added Paul Barnhardt, an IT manager at Lockheed Martin Corp., in Kannapolis, N.C.:

"We've come a long way [with supplychain compliance] in the past 90 days."

■ IT professionals are convinced that Y2K will amount to nothing more than minor problems. Only 7.3% of those surveyed said they believe it will cause significant problems for the U.S. economy.

Five in six organizations have or plan to develop contingency plans in the event of Y2K failures. Asked which factors are driving their contingency planning, respondents overwhelmingly cited concerns with their supply chains and with companies that provide them with telecommunications and utilities.

But IT managers interviewed for this report cited concerns about potential problems in some countries, as well as with smaller businesses in the U.S.

Managers also said they scoff at the Y2K hype and fear that has been generated in some media. "I honestly believe that most of us are smarter than all of the negativism we hear out there," said Frank Longo, a systems architect at Mutual of America Life Insurance Co. in Boca Raton, Fla. "I chuckle at the doom and gloom that I hear."

Little Impact

IT managers are increasingly confident that year 2000 won't cause any more than spot problems throughout the U.S. economy

COMPANIES THAT FEEL THERE WILL BE ONLY SPOT PROBLEMS, MINOR PROBLEMS OR NO IMPACT:

 MINOR PROBLEMS OR NO IMPACT:

 September 1999
 93%

 June 1999
 89%

 March 1999
 84%

 October 1998
 65%

 Base. Survey of 300 IT managers





No one ever got fired for buying you-know-who? Not anymore.

e-commerce, you need a company with a proven deployment record for fast return on investment. Intershop.

Just because someone built your mainframe doesn't mean they should be providing your e-commerce solutions. And starting October 3, you'll see why.

Announcing Intershop Open, in New York on October 3-6.

Intershop's first e-commerce conference for developers, users, and partners, Intershap Open is a showcase of the latest innovations and technologies to help e-commerce businesses thrive today and tomorrow. Sessions will emerging web business models and how Intershop can help partners assist clients to make the most of e-commerce.

So if you are a professional service provider, an enterprise looking to set up an e-commerce site, or an independent software vendor developing e-commerce solutions, register today to take advantage of this opportunity.

Just visit our Website at www.intershop.com/open or call us 1-800-942-6020.



Hurricane Tests Recovery Plan

WILBUR: "Our plan

requires some

decisions to be

made two to three

Data center braces for Floyd but stays online

BY CAROL SLIWA

HE TIME IS NOON, Monday, Sept. 13. Hurricane Floyd is churning through the Caribbean, more than 400 miles east-southeast of Miami. But its 155-mph winds, massive 600-mile width and projected path are a red alert to Convergys Corp. storm

The Cincinnati-based customer service giant - whose clients include AT&T Corp., American Express Co., Federal Express Corp. and Toys R Us Inc. — operates a 3,300employee call/data center in Jacksonville, Fla., which could take a direct hit. Forecasters don't have all the answers on Monday, but the Convergys incident management team which has been meeting every six hours since Sunday morning - can't wait if it days out" wants to make sure it can continue to service its customers.

"When a client outsources to us, they expect us to be prepared to deal with disasters and [provide] business continuity," said Jim Kutsch, an executive director of Convergys' integrated technology services.

For the first time in 18 years, Convergys makes a formal disaster declaration and invokes its 6-year-old "incident management process." Critical staffers — armed with tapes — board planes and begin reconstructing the data center in Philadelphia, at a SunGard Recovery Services Inc. site.

"It's much easier to predict with accuracy within six or 12 hours — yet, our plan requires some decisions to be made two to three days out," said David Wilbur, an executive director of integrated technology services.

Convergys can wait to decide if it really needs to shut down Jacksonville's data processing but must have staff loading operating systems and applications 36 hours before the hurricane's landfall. "We would never rely on the fact that this building could withstand 140-mph winds," said Wilbur.

Jacksonville wasn't the only area of concern. Convergys, which has 33,000 employees worldwide, also has East Coast call centers in Fort Lauderdale and Orlando, Fla.; Greenville, N.C.; and

Halifax, Nova Scotia. Those sites, however, could be closed, and their telephone traffic switched to other centers. The Jacksonville data center move was more complicated because of the data processing equipment.

By noon Tuesday, as authorities evacuated millions from Florida, Convergys closed the Jacksonville call center but left some data operations running. Some 140 staffers traveled by road to Atlanta.

Others powered down PCs and bagged them in plastic, turned off air conditioning, elevators and anything

they could to conserve electricity. "We wanted to be prepared to lose generators and still keep the essential equipment online," said Kutsch.

Tuesday evening, Convergys staffers learned that Floyd would take a northerly turn and that Jacksonville would suffer winds no higher than 60 mph, with gusts no greater than 70 mph.

"That's well within our parameters," said Kutsch. So even though Philadelphia was ready, Jacksonville never

ceased its data processing.

That worked to the company's advantage because bringing up another data center often can mean some lag time, said Kenneth Brill, a disaster prevention expert who runs Computersite Engineering Inc. in Santa Fe, N.M. "It's obvious they had this [process] laid out ahead of time, because you can't think out all those actions on the spur of the moment," he said. "There's a lot of research that went into setting up the trigger criteria. Most people would not do as well."

As the Fort Lauderdale facility reopened, Convergys' North Carolina centers were shutting down, and their telephone traffic had to be rerouted. Meanwhile, Halifax was on alert.

"In the other non-Florida, non-North Carolina centers, we asked for volunteers to work overtime," said Kutsch. "Therefore, we handled more than the standard amount of calls in the other centers."

As Floyd swept past Nova Scotia, Convergys staffers began tracking a new hurricane, Gert.

MOREONLINE

www.computerworld.com/more

For resources related to disaster and recovery management, such as papers and organizations, visit our Web site.



Be up all hours? For Compaq servers, no problem. That's why so many e-businesses trust them. And why Compaq's Web server market share is 28.9% vs. Sun's 14.6% and IBM's 13.1%. Also,

Your server is your showroom.

Are the doors always open?

Compaq servers are peak-hour speed demons. Making customers happy and e-businesses grow. For example, after its first six months, drugstore.com[®] became the 7th largest e-tail site in the U.S. (according to PC Data, Inc., 6/99).

Their Compaq solution (ProLiant and AlphaServer systems running Oracle8") kept up with the growth, as did their equally scalable Compaq storage. Another good thing: as Compaq NonStop®e-Business Solutions, AlphaServer systems include a full suite of Internet management software, built in. For more, visit www.compaq.com/alwaysopen, contact your reseller or call 1-800-AT-COMPAQ.

Why Compaq?

Savs drugstore.com CIO Kal Raman, "One of the big advantages of working with Compaq is the support we get. They replaced Sun platforms with a seamless integration of Compaq ProLiant running Windows NT and AlphaServer systems running Tru64 UNIX, in record time."

Left to right: Compaq AlphaServer, Compaq ProLiant, Compaq NonStop Hunalaya

Better answers:

BUSINESSOPINION

WORKSTYLES

What's It Like To Work at . . . Jockey International Inc.?

■ Interviewee: Kathy Breiling, application systems project leader, a 15-year veteran

■ Company: Jockey International Inc. (www.jockey.com)

■ Main location:

Kenosha, Wis.
■ Where's that?
The southeastern corner of
Wisconsin, 45

minutes from
Chicago and 30 minutes from
Milwaukee.

■ Number of IT employees: 45

■ Number of end users: About 5,000

■ Other area employers: Snap-On Inc., Daimler-Chrysler, S. C. Johnson & Son Inc.

■ Dress: Business casual

■ Workday: Flextime. Shifts start at 6:30 a.m. and end at 5 p.m., with a half-hour for lunch.

■ What's the building like? It's 97 years old. Jockey started out as S. T. Cooper &

Sons in 1876 in Chicago. The Jockey brand was born in 1935, when the company

invented the first-ever men's briefs. "This building was originally a manufacturing and office facility, and the front has been very well-preserved. There's no manufacturing here anymore, and they're always taking up more and more of the old factory for

office space." ■ Decor: "Our cubicle walls are upholstered in a total 1970s color scheme - burnt orange, avocado green and harvest gold. But we're getting new walls when we move [within the building]. Inside the cubes you see people in their underwear all over the walls - people hang posters of the company's ads." ■ Which ads are the favorites? "For the women, it's a toss-up between the firemen and the doctors. For the guys, it's probably the soap opera

stars."

* What's it like to see that in

the workplace? "The first time you come here, it's weird because Jockey is very conservative but then there are half-naked people all over the

walls. But Jockey
is very particular
about tasteful
advertising. So
no one would
ever feel sexually harassed

because it's the company product."

■ Must people carry beepers? Cell phones? When on-call

■ Percentage of staff that telecommutes on a given day: "Everyone comes into the office every day. On occasion, like if you have a sick kid, you might work from home."

■ On-site day care? No.

■ In-house cafeteria/food service: "Yes, they just built a new one in the last two years. It has a high ceiling, big windows on two walls and a display case on the history of Jockey."

■ The one thing everyone

complains about:
"Probably our little cubes and the 1970s walls, which they're fixing. And

recently they smushed us all closer together to put more cubes in, so the walkway is only about 3 feet wide."

■ Free refreshments: None
■ Little perks: A 25% discount at Jockey outlet stores; social activities in the summer, including a sports league with teams for golf, men's basketball and coed volleyball.
■ Would employees feel comfortable e-mailing the CEO, Donna Wolf Steigerwaldt?
"Yes, definitely. It's a familyowned business. The CEO is very friendly and you can chat

very friendly and you can chat with her. Her daughter is the executive VP. They walk around to see how you're doing, and they're very sincere."

What accounts for your longevity at the company? "It is very close to my home, and it's a very family-oriented place. The people here are very good to work for; you feel appreciated." - Leslie Goff

JIM CHAMPY

Value beyond .com

T'S NOW AN OLD JOKE on Wall Street: If you want to increase the price of a stock, just add .com to its corporate name. It might work, at least temporarily. The danger is that Internet hype may be masking what really needs to happen for IT to help create corporate value. CEOs know that over the long term, they must create value for their shareholders. That

has traditionally meant some rational relationship between a company's stock price and its profits — usually measured by a company's price/earnings (P/E) ratio. The stratospheric prices of Internet stocks are defying those traditional relationships.

But it's not just the often-profitless Internet companies that are creating shareholder value with high stock prices. Dell Computer, for example, has logged a P/E ratio as high as 93. Charles Schwab, the discount broker, had a top P/E ratio of 72. That's compared with a large bank or insurance company that might expect an average

P/E ratio between 13 and 18. A large utility today may have a P/E ratio of only 12.

It's understandable that the CEO of a bank or utility might envy the shareholder values being created by technologyenabled companies like Dell and Schwab. Institutional investors are turning the heat up; everyone wants to create more shareholder value. This means traditional companies will be looking harder to find a silver bullet in IT or the Internet to improve their stock prices. Sorry — there are no silver bullets, and .com alone won't work in the long term.

But look more closely at the way markets are valuing stocks. It provides a clue about how IT can increase corporate value.

First, recognize that most older, large companies have built vertically integrated operations. They pride themselves on being able to do everything themselves. General Motors is the classic example of a vertically integrated company. And most large banks,

manufacturers and utilities look the same. For the past 50 years, we have been using IT to try to make vertical integration work. The stock market is telling us that investors no longer put a premium on those kinds of operations. They are too expensive and too frozen in their structures.

Rather, the market is telling us that value is created through horizontal integration. A hori-

zontally integrated company is one that usually does one thing exceptionally well and depends on others for additional products and services. When IT is used to create horizontal linkages, value is created.

When you look closely at Dell or Schwab, that's what you see. Dell used IT to perfect its build-to-order business model, linking suppliers and customers. In doing so, it dramatically improved its business performance by eliminating inventories. Schwab has used IT to offer customers an ability to spend, invest and track money. Schwab has also been innovative in of-

fering customers the investment products of its competitors.

Both Dell and Schwab have leveraged the Internet. Dell uses it to go direct to customers, and Schwab has pioneered online trading. But it isn't the Internet alone that has boosted the value of these companies. Rather, they have used the Internet and IT to change their operating models to create horizontal integration between their customers and suppliers. This enables an agility that both Dell and Schwab exhibit.

But don't expect Wall Street or its analysts to understand how IT investments enable horizontal integration. Markets and analysts don't have the patience to do that. What investors do understand and look for is a new business model that can assure both growth and profits. That's when they will reward a company with an exceptional P/E ratio.

On the other hand, CEOs must understand the relationship between IT and horizontal integration. New business models —

like those of Dell and Schwab — won't emerge without massive operational and organizational change. CEOs need to have the ambition and appetite for change to make that happen.

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. Contact him at JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.



When IT is used to create horizontal linkages, value is created.

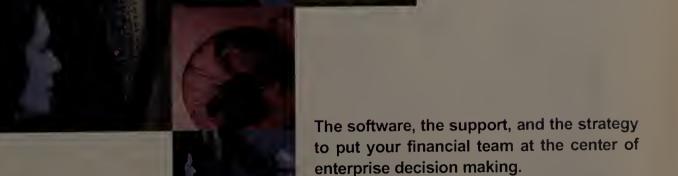


Is waiting for information costing your finance team the game?

Your finance team plays a pivotal role in reaching your company's business goals...a role that goes way beyond keeping score. With **CFO Vision™**, you can give the team a complete and integrated financial management solution. One that leverages technology for true competitive advantage, while reducing reliance on your IT staff.

- Integrated online analytical processing (OLAP) for unlimited views of business information—by customer, product line, market sector, geographic boundary, and more—in any currency including the euro
 - Data warehousing and financial intelligence for turning dispersed financial and non-financial data—from any source including ORACLE® and SAP—into online business information
- Flexible system maintenance for reacting quickly to changing business drivers: acquisitions, mergers, and organizational realignments

reach your business goals CFO Vision™



giving us a call at 919.677.8200.

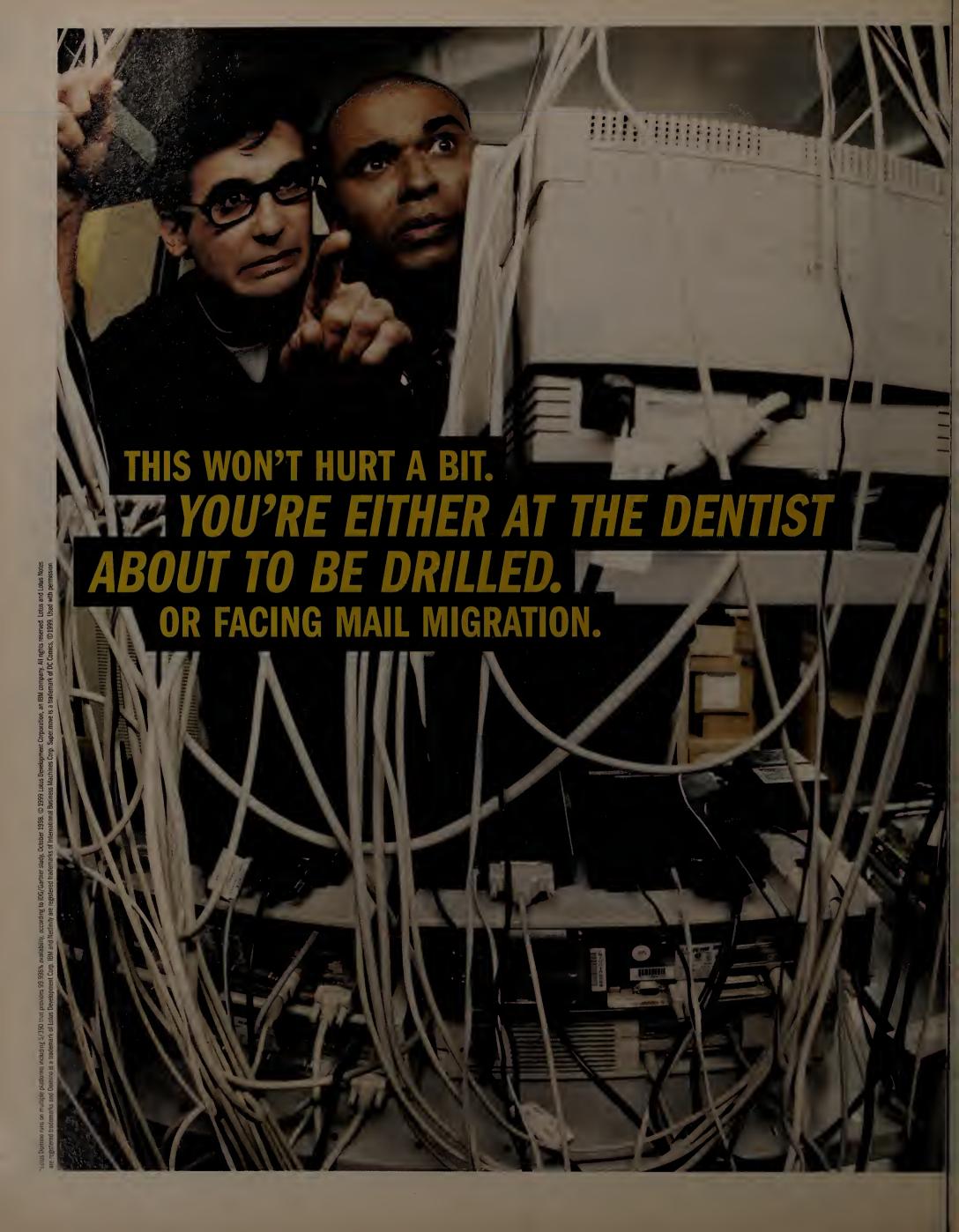
Learn more with our free guide and video, available by visiting www.sas.com/gocfo or

The Business of Better Decision Making

www.sas.com/gocfo

E-mail: cw@sas.com

919.677.8200



We feel your pain. Seriously. When you upgrade or migrate with Lotus, the global messaging leader with more than 42 million seats, you benefit from years of experience. The direct result is a comprehensive program called Super.move that will help make your

Introducing SUPER.MOVE. Mail migration made simple.

migration as simple and efficient as superhumanly possible. It will guide you through all stages without leaving you hanging. Ever.

Put another way, this means better than 99.9% reliability.* Because Lotus is one of the most reliable and lowest maintenance messaging and collaboration solutions, you won't need to constantly worry about it. No matter how many users are added or how much your business grows.

SUPERHUMAN PAIN RELIEF

While some dream about a life of ease, we're doing our utmost to make that a reality for you.

Which brings us to the newest version of Lotus Notes* and Domino™ Release 5. With it, you get complete control over your messaging infrastructure. Thanks to its specialized administration tools, remote server administration and centralized user management, you can check on your system and get a comprehensive picture of what's happening, no matter where on Earth you are. No matter when.

For your users, the new Notes and Domino has a customizable, browserlike interface that's more intuitive and will make the transition easier and require less training. This means fewer headaches for you and your end users.

We're not kidding about making this less of a pain.

Notes and Domino will fit seamlessly into your infrastructure and run on nine different platforms, plus integrate with databases and legacy applications. Incidentally, most IBM Netfinity* servers include Domino Mail Server at no extra charge.

We're not just talking about switching to another e-mail system here. We're talking about advantages like industrial-strength calendaring and scheduling, mobile computing, fax and pager gateways, and last but certainly not least, robust never-fail e-mail.

Superhuman software means you know what's happening. And that you can do anything. In this case, that includes mail migration.

SO LET'S GET DOWN TO IT

Register now for the Super.move program by visiting www.lotus.com/supermove or call 1800 872-3387, ext. E509, and get a free 90-day trial of the Lotus Domino R5 messaging server and Lotus Notes R5 client.

SUPER.HUMAN.SOFTWARE



ONLY LOTUS OFFERS:

- Integrated user interface includes e-mail, calendaring & scheduling and direct Web access.
- Compatibility with existing systems and platforms.
- Rock-solid reliability from the leader in mail and messaging.
- Migrate at your own pace.
 Grow as your system grows.



SUPER.MOVE MIGRATION EVALUATION KIT

The Super.move program is a commitment to help you upgrade or migrate efficiently and comfortably. This includes a collection of solutions such as special pricing, education, support and the tools required to grow at your own pace.



COMPUTERWORLD'S THIRD ANNUAL TOP TECHNO-MBA SURVEY



Quick: Which schools are the hottest tickets for technology-related MBAs? Harvard? MIT? Stanford? Berkeley? Guess again

UDGING BY the recent results of our annual survey, the best MBA programs for would-be CIOs and technology-savvy exectives are all dark horses — with Boston's Northeastern University, the University of Texas at Austin, the University of Maryland at College Park and the University of Alabama at Tuscaloosa leading the way.

This past spring and summer, Computerworld surveyed 1,000 campus recruiters to discover 25 schools that did the best job of preparing students to be tomorrow's technology leaders. We then surveyed 63 schools from the recruiters' top choices to find out what the schools' techno-MBA programs consisted of and what their placement rates were for graduates.

Typically, techno-MBA programs are hybrids: Using a real-world, hands-on problem-solving approach, they combine standard MBA courses in accounting, finance, marketing and so on with a solid background in technology. The programs teach engineering and computer science students to become top businesspeople with good communication skills; likewise, they teach people with business or communication backgrounds to become savvy technologists.

Surprisingly, none of the usual MBA-program suspects, such as MIT's Sloan School of Management, Carnegie-Mellon University and the University of Pennsylvania's Wharton School, made our top 25 list for techno-MBAs.

For years, CIOs have complained loudly that college graduates are ill-prepared to become information technology leaders — a sentiment that's frequently echoed by students themselves. Even such elite institutions as MIT haven't produced enough of the kinds of techno-savvy MBA graduates that companies say they really need.

The reason for this, says Howard Frank, dean of the University of Maryland's business school, is that the elite MBA programs have their hands full training standard-fare MBA students.

"The big schools are doing a great job at training MBAs," says Frank, who also happens to be a senior fellow at the prestigious Wharton School. "They don't have the pressing need to move as rapidly into technology programs."

That has left lesser-known schools with a wide opportunity to compete on a technology basis.

"Our excitement [with] techno-MBA grads is due to the fact that they not only have excellent technology skills, but they also understand the strategic, business application of technology," says Dennis Jones, senior vice president and CIO at Federal Express Corp. in Memphis, who culls many recruits from the University of Texas. "In addi-

tion, their communication skills are superb. They're able to cogently present business cases for the deployment of technology into strategic projects."

Techno-MBA programs are working hard to offer what the famous programs — at least so far — haven't really delivered: well-prepared, carefully trained technologists with good communication skills, and skillful communicators with a good grasp of technology.

"We've developed a strategy to differentiate ourselves along the lines of technology, entrepreneurship and global knowledge management," says

Elite schools won't be able to sit on their laurels much longer, as the results of this year's techno-MBA survey sound a wake-up call. In a prescient June 14 interview with *Computerworld*, Richard Schmalensee, dean of MIT's Sloan School of Management, confessed that MIT is "awake, but we may still get crushed" if changes aren't made in its current education programs.

In nearly all cases, graduates of the best techno-MBA programs receive multiple job offers, often landing positions that pay \$80,000 to \$100,000 per year or more and offer perks such as lucrative stock options. "Before I went to graduate school, I received no stock options from the companies I worked at," says Charity Elkins, who is a program manager at Microsoft Corp. in Redmond, Wash. "After I graduated, I was granted copious options."

What else do the best techno-MBA programs offer? The following profiles provide a full picture of the curricula offered by the four top-rated techno-MBA programs in the *Computerworld* survey:

Northeastern University, Boston www.cba.neu.edu
Phone: (617) 373-4777



Northeastern University

Neighbor to Harvard University and MIT in Cambridge, Mass., Northeastern is the best school for getting a techno-MBA, according to our survey. Billing itself as "the premium program in New England for fast-track managers in high-tech product and services industries," Northeastern's High Technology MBA program works closely with regional companies — from Fortune 500 corporations to start-ups — in the systems and software, financial ser-

vices, health care and biotechnology industries.

Faculty to Student Ratio: 1-to-3. The program takes in 40 to 45 students out of roughly 100 applicants each year.

Curriculum: Northeastern's curriculum combines courses in marketing, finance, team leadership and "organizational transformation." Fifteen faculty members teach courses such as Innovating Strategies in High-Tech Environments, Analytical Models and Methods for Managerial Applications, Strategies for Companies in Crisis and Strategic Management of Supply Chains.

"We take technical people and teach them how to manage in a fast-changing environment," says program administrator Kate Klepper. All students work while enrolled in the courses. Classes are held at night and on one Saturday, every other week.

Special Feature: The school is home to the Center for Technological Entrepreneurship, which hosts a \$60,000 Business Plan Competition and sponsors other awards, hosts speakers and brings together entrepreneurial leaders and students. The result: Northeastern is second only to MIT in spawning high-tech entrepreneurs in the Boston area.

Getting In: Tough. The majority of enrollees are career engineers and computer scientists who already hold jobs in management or have postgraduate degrees, and there's a waiting list to get in. Graduate Management Admission Test (GMAT) scores tend to be in the 600s. All applicants are required to have a personal interview with Klepper. Placement Record: Upon graduation, half the students change jobs and receive promotions, with an average 26% salary increase over two years.

Alumnus Comment: "The curriculum is very focused, and the students tend to have a lot in common. The program is a great differentiator, and it will make me a more valuable employee for my next managerial position," says Lewis Levine, director of software development at Visualization Technology Inc. in Wilmington, Mass.

University of Texas at Austin http://texasinfo.bus.texas.edu/home.asp
Phone: (512) 471-5900

The University of Texas at Austin's Information Management concentration is one of the better-known programs for techno-MBAs, having occupied the No. 2 position in our last survey, conducted in 1997. The school boasts leading programs in many areas, but technology, entrepreneurship and globalization represent three areas of special strength.

Continued on page 59

67

YOU CAN'T
ESCAPE FROM
THIS SCHOOL
WITHOUT A
CROSS-CUTTING
UNDERSTANDING
OF BOTH
BUSINESS AND
TECHNOLOGY.

HOWARD FRANK, BUSINESS SCHOOL DEAN, UNIVERSITY OF MARYLAND

BUSINESSSPECIAL REPORT

COMPUTERWORLD'S TOP 25 TECHNO-MBA SCHOOLS

College/University Av GMAT	rerage Score	Ratio of Faculty to Students	% of Grad Classes With Fewer Than 25 Students	% of Grad Classes With Internships	% of Grad Classes That Require "Real-World" Problem- Solving	% Faculty w/Ph.D. or DBA	Number of Graduates in Spring 1998	% of Spring 1998 Grads Accepting Employment Within 6 Mos. of Graduation	Average Salary of Spring 1998 Graduates	Annual Tuition for In-State Students	Tu, io i Out-of = 201 St
1. Northeastern University, Boston www.ccs.neu.edu	610	1-3	100%	100%	100%	100%	40	100%	\$79,120	\$23,100	\$23,100
2. University of Texas at Austin www.bus.utexas.edu	660	1-18	55%	100%	100%	100%	80	100%	\$70,346	\$6,144	\$15,354
3. University of Maryland, College Park www.rhsmith.umd.edu	648	1-11	40%	90%	60%	100%	47	100%	\$65,324	\$9,860	\$14,090
4. University of Alabama, Tuscaloosa www.cba.ua.edu	625	1-7	100%	100%	100%	100%	15	100%	\$59,000	\$2,600	\$7,200
5. University of California, Irvine www.gsm.uci.edu	652	1-7	50%	86%	50%	100%	37	100%	\$106,200	\$11,192	\$20,576
6. University of Illinois, Urbana-Champaigt Champaign, www.mba.cba.uiuc.edu	ⁿ 616	1-4	35%	100%	80%	100%	29	100%	\$55,500	\$11,788	\$18,546
7. Purdue University, West Lafayette, Ind. www.mgmt.purdue.edu	623	1-3	100%	95%	50%	100%	17	100%	\$88,343	\$7,176	\$15,424
8. Southwest Missouri State University, Springfield, www.mscis.smsu.edu	580	1-20	100%	100%	60%	100%	17	100%	\$62,000	\$6,210	\$6,210
9. Carnegie Mellon University, Pittsburgh www.gsia.cmu.edu	654	1-5	0%	100%	25%	100%	52	100%	\$82,824	\$25,130	\$25,130
10.University of Florida, Gainesville www.cba.ufl.edu	605	1-20	100%	85%	25%	100%	45	100%	\$60,000	\$2,800	\$8,100
11. University of Minnesota, Minneapolis www.csom.umn.edu	637	1-10	40%	100%	30%	100%	75	100%	\$69,615	\$11,430	\$16,162
12. University of Pennsylvania, Philadelphia, www.wharton.upenn.com	685	1-9	44%	100%	50%	100%	55	100%	\$96,750	\$26,290	\$26,290
13. University of Southern California, Los Angeles, www.marshall.usc.edu	650	1-15	0%	90%	100%	70%	150	100%	\$80,000	\$23,958	\$23,958
14. Temple University, Philadelphia www.sbm.temple.edu	550	1-5	100%	40%	30%	100%	40	100%	\$55,000	\$6,100	\$8,500
15. Arizona State University, Tempe www.cob.aus.edu/MBA	601	1-12	38%	62%	76%	100%	74	98%	\$72,500	\$4,160	\$11,112
16. Bentley College, Waltham, Mass. www.bentley.edu	557	1-8	44%	78%	65%	100%	41	100%	\$60,721	\$20,050	\$20,050
17. Georgia Institute of Technology, Atlanta, www.iac.gatech.edu/dupree	632	1-10	0%	100%	100%	100%	25	100%	\$67,200	\$3,600	\$12,400
18. University of Georgia, Athens www.cba.uga.edu	630	1-27	33%	20%	80%	100%	35	100%	\$48,400	\$4,092	\$12,840
19. Northern Illinois University, DeKalb www.cob.niu.edu	560	1-15	80%	90%	80%	90%	25	100%	\$48,000	\$3,703	\$7,879
20. Brigham Young University, Provo, Utah www.msm.byu.edu/programs/mism	640	1-8	64%	100%	22%	100%	4	100%	\$51,250	\$2,560	\$3,840
21. University of Virginia, Charlottesville www.commerce.virginia.edu/ms-mis	620	1-20	80%	100%	25%	90%	28	100%	\$52,000	\$5,000	\$15,000
22. Texas A&M University, College Station www.tamu.edu/cba	ⁿ 628	13-97	15%	85%	67%	100%	23	100%	\$52,691	\$3,277	\$8,389
23.University of Connecticut, Storrs www.sba.uconn.edu	609	1-6	100%	7 5%	50%	100%	10	100%	\$75,000	\$6,230	\$14,654
24. Miami University, Oxford, Ohio www.muohio.edu	550	9-10	100%	15%	66%	78%	9	100%	\$49,000	\$5,800	\$13,000
25. California State University, Sacramento, www.csus.edu/mis	564	10-197	60%	100%	40%	100%	15	100%	\$55,000	\$1,006	\$3,220

In January, Computerworld conducted a two-part survey. We polled 1,000 campus recruiters on their picks for the top 10 techno-MBA programs, based on a list from the American Assembly of Collegiate Schools of Business. Based on those results, we sent surveys to approximately 350 U.S. colleges and universities that offered graduate programs. We asked the deans of each institution about the technology-focused programs offered at their school, the faculty-to-student ratio, education and background of professors, internships and career placement. Rankings were based on several criteria, each given equal weight and scored separately.

BUSINESSSPECIAL REPORT

COMPUTERWORLD'S THIRD ANNUAL TOP TECHNO-MBA SURVEY

Continued from page 57

Faculty to Student Ratio: 1-to-8.

Curriculum: Students take standard core courses of the MBA program — accounting, statistics, economics and a choice of marketing, operations or management courses. In addition, they take a set of courses in the design, construction and control of information, information strategy and new business models. In their second year, students select from elective courses in areas such as technology strategies, e-commerce and financial information management.



University of Texas at Austin

Special Feature: In the first year, students are paired in a "cohort system."

"We identify the technical and the nontechnical people and make them live together for two years," says program director Tim Ruefli. "They learn to speak each other's language."

The result: "Our people tend to be used as change agents," who are known for their propensity for teamwork, Ruefli says. Students work on real-world projects with organizations including Fannie Mae, Cisco Systems Inc. and Dell Computer Corp.; professors team-teach with CEOs and venture capitalists.

Getting In: Deceptively difficult. The school reports it doesn't require minimum grade-point average (GPA) or GMAT scores, personal interviews or previous coursework in management or business administration, but grades and letters of recommendation do matter, says Ruefli. The program also requires the equivalent of two years of full-time work experience, but the average is four years. You'll need to be proficient in business calculus, spreadsheet applications and communication skills, too.

Placement Record: Of 100 graduates last year, all landed jobs. The average number of offers received was 2.3, and the average annual salary was

\$100,000, plus bonus.

Alumnus Comment: "Enrolling in the MBA program at University of Texas was the best money I ever spent," says Charity Elkins, program manager at Microsoft.

University of Maryland http://www.rhsmith.umd.edu:8001/mbams/

The University of Maryland's large techno-MBA program has so closely intertwined its standard MBA courses with technology that every student gets a solid grounding in both business and technology. "You can't escape from this school without a cross-cutting understanding of both business and technology," says Dean Howard Frank.



University of Maryland

Faculty to Student Ratio: 1-to-20. Curriculum: The MBA program offers an enormous number of cross-functional courses; students combine standard MBA courses (accounting, marketing, management and so on) and concentrate in areas such as logistics/supplychain management, e-commerce and business telecommunications. Each area of concentration includes IT-specific courses; a student with a concentration in information systems takes courses in areas such as decision-support systems, e-commerce or telecommunications and computer networks. The concentration in e-commerce covers development, implementation and management of e-commerce systems and more.

Special Feature: Highly diverse, with plenty of hands-on practice. Of fulland part-time MBA students, 39% are

women (Carly Fiorina, the newly named CEO of Hewlett-Packard Co., received her MBA from the university in 1980), 15% are African-American or Hispanic and 36% are international. It's also huge, with 400 full-time and 450 part-time MBA students.

Getting In: The graduate school requires a B average or 3.0 GPA. Letters of recommendation are important. Students have worked an average of 4.3 years; GMAT scores range from 580 to 710. Placement Record: 100%. Graduates receive an average of 2.3 job offers; 35% of graduates go into the high-tech arena, most into consulting. Salaries range from \$85,000 to \$90,000 per year upon graduation.

Student Comment: "The program fills in a lot of gaps in my knowledge. It's given me a much broader business perspective in my understanding of technical projects. The school also has an excellent technology infrastructure; as soon as something new comes out, we're working with it," says Alan Potter, a second-year MBA student and IT consultant.

University of Alabama
http://www.cba.ua.edu/mis
Phone: (205) 348-4537

As a secret source of techno-MBAs, the University of Alabama takes unlikely undergraduate students — those with bachelor's degrees in science or liberal arts — under its academic wing. And its unlikely curriculum molds wet-behind-the-ears students into tomorrow's leaders through a program of immersion.

"We try to fill a niche by bringing the highest value-added to a master's program," says Joanne Hale, the assistant professor of MIS in charge of the MBA program's systems consulting concentration. "We take liberal arts undergraduates with no work experience and turn them into great managers." The unique "boot-camp" approach is tough, but it works.

Faculty to Student Ratio: 1-to-4.

Curriculum: The first year consists of lock-step MBA courses such as finance, economics, management and market-

ing. The handful of students who are chosen to take part in the systems consulting concentration are put through the boot camp, then assigned internships that place them in positions of responsibility at various firms.

In their second year, students are required to produce a project case study based on their work experience. Before they graduate, they are paired with finishing MBA candidates in a mentor-student relationship, in which they work on large-scale commercial projects. "We take students all the way through the life cycle of the project," says Hale. The crowning moment comes when MBA students present the results of their projects to the executive board of the company for which they have worked.

Special Feature: The requisite boot camp, which occurs between the first and second years, is the educational equivalent of combat training. Working 72 hours per week over a course of three weeks, students take back-to-back courses covering telecommunications, programming, database management and so on.

Then they're placed in managed internships, in which during the next several months, they put into practice everything they've learned. Working with MBA "mentors" in the final stages of the program, they also meet with their instructors every two weeks. "It's total immersion," says Hale.



University of Alabama

Getting In: Students are mostly liberal arts undergraduates with no work experience; for this reason, test scores and GPAs really count. The minimum GPA is set at 3.25; the average GMAT score is 630. "We look for well-rounded people who have a diversity of interests, like working in teams and as mentors and are real problem-solvers," says Hale. Placement Ratio: All 14 of the May graduates landed promised jobs. Starting salaries range from \$55,000 to \$75,000 per year - not bad for students with no or little previous work experience. Alumnus Comment: "The program was very demanding. Professors expected us to pick up information quickly. The program prepared me for managing a large leadership role in my career," says Jill Cornelius Irvin (class of '97), a principal at Computer Science Corp. 1

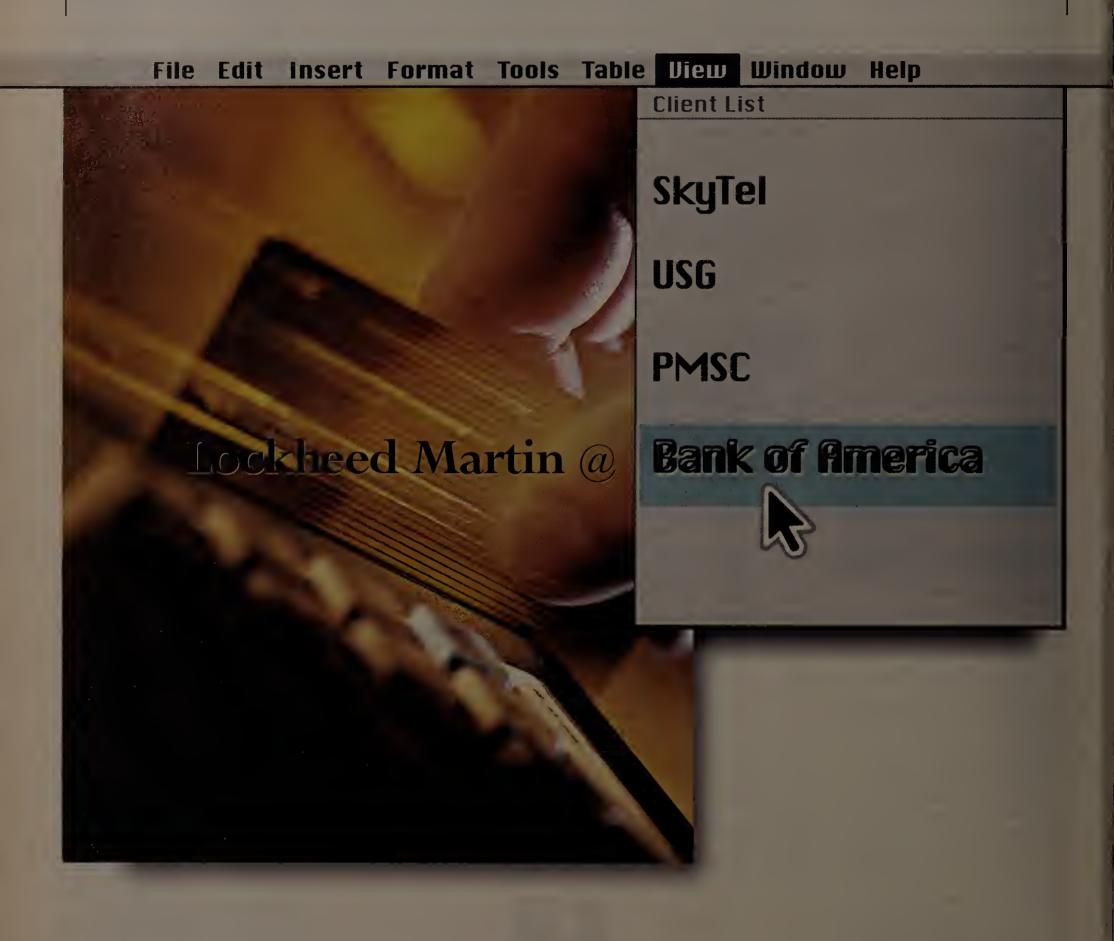
Fryer is a freelance writer in Santa Cruz, Calif.

67

WE TAKE TECHNICAL PEOPLE AND TEACH THEM HOW TO MANAGE IN A FAST-CHANGING ENVIRONMENT.

> KATE KLEPPER, PROGRAM ADMINISTRATOR, NORTHEASTERN UNIVERSITY

MISSION: When Bank of America invested in new technology, they knew success required that people could use it. But how? Traditional training was too slow; hiring new employees too expensive. Lockheed Martin's solution: a business-smart process called reskilling. It uses real projects to teach new skills, guided by experienced coaches.



LOCKHEED MARTIN

SUCCESS: Reskilling did more than train people to run computer systems; it taught people to rethink how they used those systems. The result: competitiveness sharply higher across the company, and a workforce with lower turnover. To see what Lockheed Martin IT expertise can do for you, visit www.lockheedmartin.com.

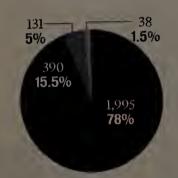


CANA ECHNO-MBA

GRADHELP

Technodisciplines

According to the federal government, 93,320 master's degrees in business administration and administrative services were awarded in 1996, of which 2,554 fall into the "techno-MBA" category. Those degree holders specialized in the following:



- Management information systems and business data processing, general
- Business systems networking and telecommunications
- Business information and data processing systems, or other
 Business systems analysis and design

SOURCE: U.S. DEPT. OF EDUCATION. NATIONAL CENTER FOR EDUCATION STATISTICS INTEGRATED POST-SECONDARY EDUCATION OATA SYSTEM "COMPLETIONS" SURVEY ACADEMIC YEARS 1991-92 THROUGH 1995-96.

COMPANY:

Exports say they can beln h

Experts say they can help bridge the technology-business gap, but you may have to fight with other firms to bring them aboard

BY FAWN FITTER

BOUT A DECADE AGO, information technology hiring managers began to notice a new breed of candidates for management positions: the techno-MBAs, or business school graduates whose studies focused on how technology supports business processes.

Blending technical know-how with strategic analysis, these hybrids quickly became hot properties. The companies that hired them expected a higher level of performance — not necessarily that the graduates would be able to build both a database and a marketing

strategy, but certainly that they would understand the role technology could play in building a business.

After several years of management/ IT cross-pollination, have companies gotten what they expected?

Paul Renard, vice president of standard procurement systems at American Management Systems in Fairfax, Va., responds with an enthusiastic "yes." He says the techno-MBAs the business and IT consulting firm has recruited have stayed longer than employees with standard MBAs and, in fact, "bring more to the table."

"Two years ago, I was saying that it's

nice to have MBAs who are grounded in the real world and interested in working with technology," Renard says. "Today, if all other things are equal, I prefer to hire someone with ... a technology focus and an MBA. Their ability to provide value is higher. In an organization that expects you to walk in the door and start producing right away, they're able to do that."

If increasing enrollment and heated recruiting at a few techno-MBA programs are indicators, others are also enthusiastic. At Carnegie Mellon University's Graduate School of Industrial

Administration (GSIA) in Pittsburgh, one of the earliest programs to incorporate a technological discipline, enrollment is expected to be higher than the usual 220 full-time and 50 part-time students, Deputy Dean Fallaw Sowell says. Demand has led GSIA to partner with the School of Computer Science to launch a one-year master of sciences program in e-commerce. That program, which started May

12, is fully enrolled with 37 students, and queries are rolling in for next year.

"The trend is clearly toward managers who are comfortable with technology," Sowell says. "They have to understand how technology is changing the business model."

Students specializing in information management at the University of Texas Graduate School at Austin average four job offers at graduation — twice as many as those in the school's other MBA programs — and the offers come earlier, for 25% more money, says program director Tim Ruefli. The demand is so great that the program has grown more than fourfold since its founding in 1991, from 25 students to more than 100. What's more, he says, he expects the program will almost double in three to four years, graduating 150 to 180 students per year by 2003.

What makes techno-MBAs popular? Ruefli quips that "the businesspeople can talk about technical stuff, and the technical people can form a complete sentence." Seriously, he describes techno-MBAs as translators between those who formulate business strategy and those who implement the technology that drives it. Whether they're engineers who want to know how their work fits into the big picture or managers who want to know how technical projects contribute, all graduate with a

focused and useful set of skills.

But most companies don't stand much chance of benefiting from those skills. About half of each year's newly minted crop of techno-MBAs head straight for Diamond Technology Partners Inc. in Chicago, Deloitte & Touche in San Francisco, PricewaterhouseCoopers in New York and other top consulting firms. Another substantial percentage is hired by the Intels and Microsofts of the high-tech world. The remaining handful is fought over by recruiters for such Fortune 500 behemoths as Ford Motor Co. in Detroit, Procter & Gamble Co. in Cincinnati and Federal Express Corp. in Memphis. (In fact, Ruefli notes, Dennis Jones, CIO at FedEx, once offered only halfjokingly to hire the entire graduating class of Ruefli's program.) So woe to the small business hoping to hire from whoever's left over — there aren't any.

"It's really tough for other industries to recruit these really top-notch people. They simply can't pay as competitively," Renard notes. "[Consulting firms] tend to strip off the people who want to work in this field."

Fitter is a freelance writer in San Francisco.



TODAY, IF ALL OTHER THINGS ARE EQUAL, I PREFER TO HIRE SOMEONE WITH A TECH-NOLOGY FOCUS AND AN MBA.

PAUL RENARD.

AMERICAN MANAGEMENT SYSTEMS



WEB SITE MAY BE A

In the craze to put everything on the Web, some companies say too much By Gary H. Anthes

TEALING your company's secrets could be like taking candy from a baby — and perfectly legal. Indeed, you may have posted a virtual "kick me" sign on your digital derriere by telling your story just a little too thoroughly at your Web site.

The Internet has prompted many to see information as a free resource available to everyone, all the time; and it has allowed companies to blab and brag as never before. But often those companies don't stop to consider that it isn't just customers and job seekers who are surfing their sites.

"Companies give you information about their customers and case studies about their products. A good analyst can look at that and kind of reverse-engineer what the company is up to," says Robert Aaron, president of Aaron/Smith Associates Inc. in Atlanta and an expert on gathering competitive intelligence.

Web site development is usually driven by marketing people who are cheerleaders for the company and its products, says Ira Winkler, president of

Internet Security Advisors Group in Severna Park, Md. "But they often are not aware of proprietary information issues, and they put out more information than they should."

Sometimes information intended primarily for employee use gets linked to a company's public Web site. For example, Winkler says, one company made so much information about its network architecture available on its site that it had essentially drawn a hacker's blueprint. Another put its entire employee directory online, a one-click shopping guide for headhunters. "When the security manager found out, he went through the roof," Winkler says.

Los Alamos National Laboratory, the nuclear weapons research center near Santa Fe, N.M., combines information for internal as well as external users at its Web site (www.lanl.gov). For example, its Weapons Neutron Research Facility lists the numbers of employees' office and cellular phones.

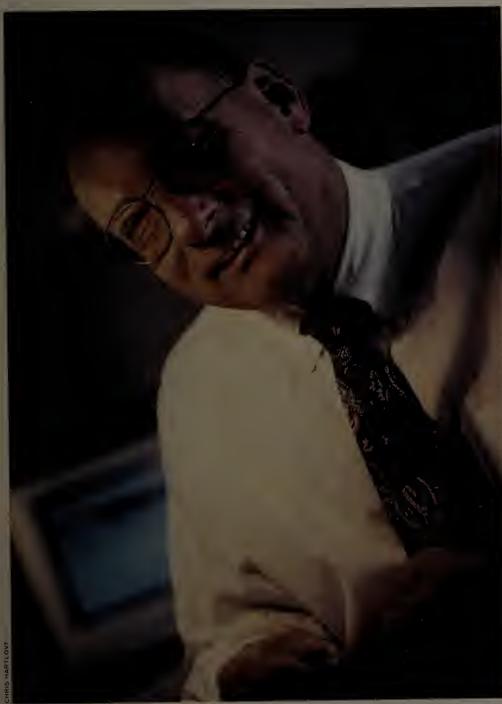
Publishing employee phone lists facilitates "social engineering" — essentially sweet-talking secrets out of employees — says Larry Watson, program manager for the FBI's Awareness of National Security Issues and Response unit. Web developers get so enthused about Internet technology and its ability to help customers and employees that "security concepts often get overlooked," Watson says.

Even if a company doesn't name its employees at its Web site, it's fairly common to detail employee benefits. That makes it easier for competitors to steal a company's employees or outbid them in recruiting.

High-technology companies seem especially prone to this practice. For example, Adobe Systems Inc. in San Jose posts its employee benefits online, including deductibles for medical and dental insurance, payroll deductions for optional coverage and details about its sabbatical programs, 401(k) plan, profit sharing and employee stock purchase plans.

Biotechnology and pharmaceutical companies are often promiscuous with their corporate information as well, says John Quinn, managing director of Quinn International in Great Falls, Va. For example, Cambridge, Mass.-based





MICHAEL LEACH: Du Pont "erred occasionally" and put too much information on the Web

Biogen Inc. has three years' worth of press releases at its Web site detailing changes among the ranks of senior employees, research and development partnerships with other companies, product development plans, the status of experimental drugs and plans to build a new research and development center. Its descriptions of open jobs detail the specific research projects and goals that go with each job. Biogen declined to be interviewed for this story.

Some companies put information on their Web sites that's better reserved for the employee intranet, says Leonard Fuld, president of Fuld & Co. Inc., a competitive intelligence consultancy in Cambridge, Mass. "Organization charts don't serve to move a sale or customer awareness ahead at all, but they can help [a competitor] understand the structure of a company, how its overhead costs are allocated and so on."

Du Pont Co. has an information-rich Web site that, for example, lists the names, addresses, telephone numbers and plant managers for manufacturers of some of its products. "If I wanted to make a similar product, it tells me

who's capable of producing it, something that otherwise would have taken a long time to put together," Aaron says.

Michael Leach, manager of information security at Wilmington, Del.-based Du Pont, acknowledges that the chemical company has "erred occasionally" in putting too much information on its Web site. But he says that's less likely to happen now that Du Pont has secure extranets for customers, suppliers and business partners.

"Du Pont has 100 lines of business, and you have lots of opinions about what's confidential and what's not," Leach says. "Why would you post the names of your distributors? Isn't that helping the competition? Yes, but it's also helping our customers find the right person to buy from."

Du Pont's decisions about Web content are made by the individual business units — "by the people who own the information and who are either going to get the benefit or suffer the pain," Leach says. Nevertheless, there are corporate guidelines for what kinds of information can be published on the Web, based on an information classification

scheme Du Pont devised in 1928.

The Boeing Co., to support its program to attract women- and minorityowned suppliers, posts at its public Web site the names, telephone numbers, business units, locations and purchasing responsibilities of its buyers. It also shows who reports to each buyer and to whom each buyer reports. "You can go up and down the personnel chart and find out who knows about fuel injectors for jet engines," Aaron says. "If you were a headhunter, it would be a tremendous resource. It's an example of good intentions gone bad."

Aaron says a risk of putting sensitive information on the Web is that the oldfashioned human filters are missing. No longer does an industrial spy have to convince a person on the telephone of his need and right to know. Aaron advises putting only basic information online, followed by a telephone number, so callers who want more information can be screened or checked out.

Timothy Powell, managing director of T. W. Powell Co. in New York, lists a "dirty dozen" of pieces of information - such as job openings and customer references — that companies look for at their competitors' Web sites (see box). But he says that doesn't mean this information should always be withheld. "They have great strategic value on the site," he says. "The idea is to weigh the benefits vs. the potential liabilities."

One way to do that is to have your own people role-play a competitor's intelligence function to see what they might glean from your information, Powell says.

Jack Buffington, director of e-business at Orion Auto in Englewood, Colo., says the inferences competitors can draw from online job postings are "a concern," but that won't deter the insurance company from the practice. He says there is so much sensitive information elsewhere on the Internet - in places such as message boards that companies can't control -- that the content at most company sites isn't that interesting to rivals.

Orion's competitive edge stems from certain innovative business processes that are available to a network of independent agents via a password-protected extranet, according to Buffington. Orion's lawyers set confidentiality standards for Internet and extranet Web content, and those standards are enforced by a strategic communications person, he says.

Such standards are vital, Winkler agrees. He advises taking a conservative approach with a policy that says all information is banned from a Web site except that which is explicitly allowed, rather than one that allows everything except that which is explicitly banned. "Web content policy should be an extension of your standard information security policy," he says.

12 Things Rivals Search For on Your Web Site

Product announcements and preannouncements:

Features and availability indicate product strengths and gaps.

Executive changes:

A person's background may provide clues about his decision-making style. Facilities openings and closings: Plants are key to capacity; offices may

indicate strategic direction. Lawsuits and court rulings:

Could indicate future liabilities. Job openings:

The skills sought may offer clues about product or strategy direction.

Suppliers or subcontractors:

May show key dependencies and sources of competitive information.

Key customers:

Could become target accounts.

Prices and price structure:

Competitors can use this information as benchmarks for their own pricing.

Financial results:

For a private company, the Web site may be the only place such information is available.

Mergers, acquisitions

and strategic alliances: Signal future direction.

Customer feedback:

Offers information about perceived product strengths and (rarely) weaknesses.

Strategy statements:

Indicate strategic intent and direction.

Source: T. W. Powell Co., New York (www.knowledgeagency.com)

Contrarian Counterintelligence

Although many security experts warn companies of the dangers of putting too much information on the Internet, one authority just shrugs at the practice. "I don't see this as a major issue in competitive intelligence," says Herbert E. Meyer, chairman of Real World Intelligence Inc. in Friday Harbor, Wash., and a senior CIA official during the Reagan administration.

Meyer says companies spend too much time studying their competitors and too much time worrying about competitors looking at them. "It's like the airplane that just watches other airplanes, then flies directly into a mountain."

Instead, Meyer tells his clients to seek business intelligence from customers, suppliers and markets and to monitor trends in science, technology, economies and politics. Says Meyer: "Are new regulations coming? Is Europe picking up? Is Latin America going down? These are the things that will make a huge difference for you - not know ing what your competitor did yesterday."

The important thing is not so much hiding your activities as keeping competitors scrambling to react to them, Meyer says.

- Gary H. Anthes

FINANCIAL & BUSINESS CONCEPTS IN BRIEF

Affinity Marketing

BY JACQUELINE EMIGH

HEN financial investors visit Quote.com, a Web-based online community geared to their interests, they can click on banner ads, icons and text links to services like one month of free trading from America First Trader.

These services from Quote.com's partners are all prime examples of affinity marketing.

Affinity marketing represents a major break from traditional mass marketing, observers agree. Instead of acting on their own to broadcast the same message to millions of customers, organizations team together to attract customers with particular interests.

Within the world of e-commerce, the concept generally translates into sharing referrals by using banner ads, icons and text links in an attempt to point customers to other sites that also meet users' individual proclivities, typically through personalization.

David Schmitlein, marketing professor at University of Pennsylvania Wharton School, points out that affinity marketing originated in the creditcard industry. There, it describes programs designed to

blazoned with the name of the affinity group, the organization benefits by getting a small percentage of the sales charged on

Affinity marketing has since spread into other kinds of referral programs, like those operated by geographically far-flung real estate offices to locate homes and real estate services across the U.S.

In e-commerce, where affinity marketing is playing an increasingly important role, the purpose is to increase site visibility, drive traffic and boost sales.

Marketing

In some cases, Web sites sell affinity links; in others, sites merely exchange them. Affinity marketing is particularly common in online communities such as America Online Inc. and those created by search engines like Lycos Inc. or Yahoo Inc. Special interest sites such as Quote.com and Siebel Systems Inc.'s Sales.com, an online community for professional salespeople, also make good use of it.

"In many cases, organizations try to transfer an affinity you have for a profession or hobby into loyalty to linked organizaDEFINITION

Affinity marketing focuses on finding customers interested in a certain product or topic, then offering that customer related products or information from multiple sellers. In e-commerce, sellers leverage relationships among one another by setting up links among their sites and marketing to one another's customers.

tions," Schmitlein notes. In addition, smaller sites can gain credibility by linking to industry giants like Microsoft Corp. or IBM, according to the professor, who refers to this as "the halo effect."

One way that search engines take part in affinity marketing is by selling links to keyword searches. Yahoo, for example, sells banner ads for use with home business, business opportunities and many other keywords. If a company buys banner ad space for any of these keywords, its ads will come up whenever a user types in one of those words.

Getting to Know You

As e-commerce sites continue to try to differentiate marketing are becoming increasingly sophisticated. Some specialized tools analyze individuals' online behavior in pursuit of personalization.

Net.Genesis, for example, provides a set of off-the-shelf tools called net.Analysis for analyzing issues that range from how long it takes visitors to view the home page to which sections of the site generate the most sales, says Michael Booth, Net.Genesis' director of business development.

Net.Perceptions, on the other hand, uses artificial intelligence technology from Neural Applications Corp. to help "put the right Web site ads in front of the right visitors," according to Neural officials.

"E-comm sites have been struggling to find ways to increase online purchasing. When you have information about online behavior, you can customize the affinity marketing opportunity," Schmitlein says.

Though enabling technologies such as personalization tools and ad servers are plentiful and easy to install, an organization's information technology specialists should be brought into the loop early to make sure the company is selecting the tools best suited to the affinity marketing job at hand.

Consultation with information technology is especially important in situations where a company needs to integrate back-end systems such as databases and transaction processing with those of affinity partners.

Sun Microsystems Inc.'s

new Sun.Com consulting service has performed systems integration for several such sites, including Sales.com, notes Mark Bauhaus, a Sun vice president.

Partnerships between e-commerce sites and technology providers don't constitute affinity relationships, though, unless the technology provider is also supplying a link to its own site. Otherwise, the aim is generally to keep the technology used in affinity marketing as invisible as possible to end users.

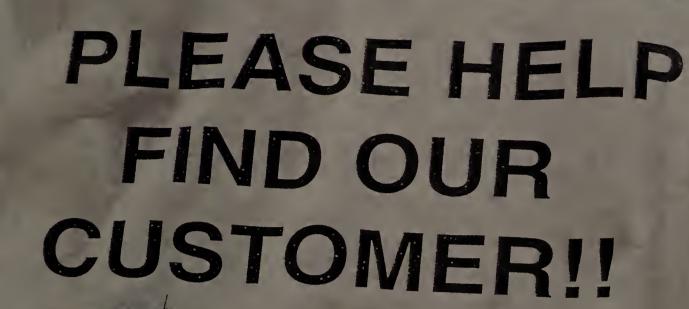
Companies also try to make the personalization experience as invisible as possible for Web visitors. Participate.com, for example, is using in-house tools to remotely manage and analyze message boards, live events and personal Web pages for online communities operated by companies such as Quote.com, AT&T WorldNet, Arthur Andersen & Co. and Careerpath.com.

Companies that develop strong relationships with their customers through personalization are also in the best position to drive affinity marketing, according to Alan Warms, Participate.com's president and CEO. "And the most effective means of creating loyalty is to learn about your customers, he says."

Emigh is a freelance writer in Boston.

Are there business terms you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.





LAST SEEN TRYING TO COMPLETE A WEB TRANSACTION. OUR INFORMATION WAS UNAVAILABLE AND WE HAVEN'T SEEN HIM SINCE.

ANSWERS TO THE NAME
"WILSON"

CALL ACME INC. 555-4253

In today's world, the information has to be there. If it's unavailable for even a moment, you'll lose customers. VERITAS software ensures you have the highest level of information availability possible. So instead of losing customers, your business can keep winning new ones. Call 1-800-729-7894 x: 81016, surf www.veritas.com, or start making those flyers.

VERITAS

BUSINESSADVICE

JOE AUER/DRIVING THE DEAL

Are 'best efforts' always good enough?

HEN YOU'RE presented a "Statement of Work" calling for best effort time and materials, the "best effort" part should set off alarms. "Best effort" is consultant-speak for "We'll try, but if we don't get there, that's OK, too." While the amount of effort by the consultant is always debatable, your obligation to pay for their time and materials isn't.

This is a totally unacceptable relationship. Consultants should tie their services to the successful completion of a project and be expected to actually perform these services at predetermined levels if they want to be paid.

With a best-efforts clause, consultants are off the hook so long as they show up. The customer can feel that the quality of service is marginal, yet the consultant will still, technically, have fulfilled the best-efforts provision. Would you have a house built under a best-efforts agreement with a builder?

Allocating risk is an important part of any contractual relationship.

Consultants who offer only best efforts aren't demonstrating any willingness to share risk, because they get paid whether or not they've provided an adequate effort. The only practical contract protection a customer has is to terminate the time-and-materials engagement if things aren't going well.

Having said all that, best

efforts may work with a particular, conscientious consultant.

But be aware that with this type of deal, you assume more risk than is reasonable. Enter into such agreements carefully, and realize you could be creating a partnership where things are divided right down the middle: The consultant gets all the money, and you get all the

Recently, a customer was renegotiating an old outsourcing agreement that was relationship. Maybe too comfortable?

Too Cozy?

As part of renegotiating, vised service levels. Under the existing agreement, the supplier could earn points for exceeding a particular service level. These points could be used as credits to

offset those times when service levels fell below their applicable metric.

On the surface, it seems like a fair allocation of risk and rewards. But in reality, it may not be. If the customer actually gets additional benefit when suppliers exceed a

particular service-level metric, then the banking concept is fair.

On the other hand, if there's no additional benefit, the customer is actually paying twice for the service: once with the normal monthly fee, and again when the supplier avoids a financial penalty for missing a service-level metric.

JOE AUER is president of

International Computer Negotiations Inc. (www.dobetterdeals

com), a Winter Park, Fla.

consultancy that edu-

cates users on high-tech

procurement. ICN spon-

sors CAUCUS: The Asso-cration of High Tech Ac-

quisition Professionals.

Contact him at

joea@dobetterdeals.com.

Additionally, the so-called "banking" approach also per-

mits the supplier to subsidize poor performance in one area with good performance in another.

The revised deal featured a more rational and traditional approach of the supplier getting paid for acceptable performance and having to issue credits for below acceptable performance.

Over the years, I've found that cozy long-term relationships can actually be a detriment to the customer.

This especially happens when the customer is dependent on the supplier to perform a vital business function. Changing the sup-

> plier would entail significant effort, so why bother if things are working well, or even almost OK? A high degree of reliance on a supplier can cause the customer to overlook or accept things like new contract terms and service levels that should be re-examined from time to time just to make sure the deal is still fair.

Comfort can and does lead to

the delivery and acceptance of poor performance. It's important to improve the status quo in contract renegotiations even when everything is working well. Developing a mind-set that embraces continuous improvement is a great way to ensure you always get what you're paying

working well. Both the customer and the outsourcer were comfortable with the

the parties revisited and re-

Stock Pricing

Burlington, Mass.-based Primeon Inc. has launched a service designed to help Wall Street firms convert their software applications so they can convert stock prices to decimals. The securities industry has set a June 2000 deadline for reporting stock prices in decimals. Stocks are currently priced in fractions such as 1/16 and 1/8.

Bank-Fraud Buster

In the wake of the \$15 billion money-laundering scandal involving the Bank of New York and Russian organized crime, Banco Itau, Brazil's second-largest bank, has begun installing a risk management/fraud prevention system from vendor Nestor Inc. in Providence, R.I.

Banco Itau plans to use Nestor's neural network-based Prism software to compare transactions against an account's historical usage patterns and against confirmed money-laundering practices. If a suspicious transaction is found, the transaction would be flagged as an action item.

Local Laggards

A report card on the year 2000readiness of communities indicates that many towns and cities lag in efforts to make sure local services won't be interrupted by Y2K problems. Preliminary results of the survey, which is being conducted by the Washington-based Center for Y2K & Society, found that many communities have been slow in areas like making sure food will be available locally and that nursing homes, hospitals and clinics will remain operational. Cities and other municipalities that have responded so far include Austin, Texas; San Francisco; New York; Boulder, Colo.; and Tampa, Fla.

Fed Chairman: **Don't Panic**

Federal Reserve chairman Alan Greenspan has warned that public fear over the year 2000 problem may have a greater impact on the economy than actual computer glitches. Speaking at a White

House-sponsored gathering on the Y2K-readiness of the financial services industry recently, Greenspan said that even a few days of stockpiling food or inventories by households or companies could lead to supply problems and other pressures on the market.

Study Finds Banks' **E-Commerce Lacking**

Financial institutions are putting significant investments into e-commerce efforts, but they don't completely understand how technology will build customer relationships, according to an Ernst & Young International survey based on more than 100 banks and insurance companies worldwide. The study found that 27% of respondents created e-commerce initiatives to hold on to customers, while 77% still collect information about customer preferences through traditional methods. Sixty-three percent of respondents have no ability to measure customer relationship management systems' impact on a company's earnings, which could lead them to invest in low-yield customers while alienating profitable ones, the report said.

Job Changes

MICHAEL DUNN, 40, tormer chiet technology officer at Dell Computer Corp.'s online unit, has been named to the same position at Time Warner Inc. in New York. . . . TONY MACEROLI, 48, has been named chief technology officer at Smart-Money.com, the New York-based investment information Web site. He was previously a vice president at J. P. Morgan & Co.





ICe. Internet Commerce Expo®

Maximize your eBusiness success at the Internet Commerce Expo®, at San Francisco's Moscone Convention Center. The 4-day conference and 3-day expo features over 200 exhibitors, in-depth tutorials and an extensive conference program focused on the latest technological advances and eBusiness solutions. Featuring keynote speakers Lou Dobbs, Former President, CNNfn, & Chairman, Space.com; Paul Otellini, Executive VP/GM, Intel Architecture Group, Intel Corp.; and Halsey Minor, CEO & Chairman, CNET. Plus numerous special events. Join the eGeneration at ICe '99 in San Francisco! Register now at www.iceexpo.com or 800.667.4423.

Conference: October 18-21 / Expo: October 19-21 THE MOSCONE CENTER / SAN FRANCISCO CA / www.iceexpo.com

Owned & Managed by:



Conference Sponsor: scient.

Corporate Platinum Sponsors:



FACETIME







Media Sponsors:



















TECHNOLOGY

SAP CRM APPS ON THE WAY

SAP AG says its first customer-relationship management applications should ship by the end of next month. But don't expect its full CRM suite to be ready until 2001. • 71

SUPREME TEENS?

Would you trust your business to an enterprise resource planning system installed by a teen-ager? California's Contra Costa County government did, and maybe you should, too, says technology evaluations editor Cynthia Morgan. • 71

LOOKS VS. WEIGHT

IBM unveils three laptops, including one featuring the company's first 15-in. laptop display. But the heavier weight of the new units may turn off some users. • 76

THIN CLIENTS GAIN MEMORY

Better graphics, more memory, lower prices and support for more operating systems — that's the promise of new thin clients from major PC vendors. • 76

DEFENDING Back Orifice

Bruce Schneier, president of computer security and cryptography consulting firm Counterpane Internet Security, says Back Orifice 2000 is no more a mali-

cious hacking tool than PC Anywhere or Microsoft's Systems Management Server. • 77

COPPER SAVINGS

Gigabit Ethernet over copper wiring was high on the agenda at Networld/Interop. And no wonder: It could allow businesses to build high-speed networks without rewiring buildings with fiber-optic cables. • 77

DIVIDE AND CONQUER

That's one way to keep your Web site operating. Online distributor Onsale Inc. uses a distributed architecture to keep total downtime to about 20 minutes per quarter. • 81

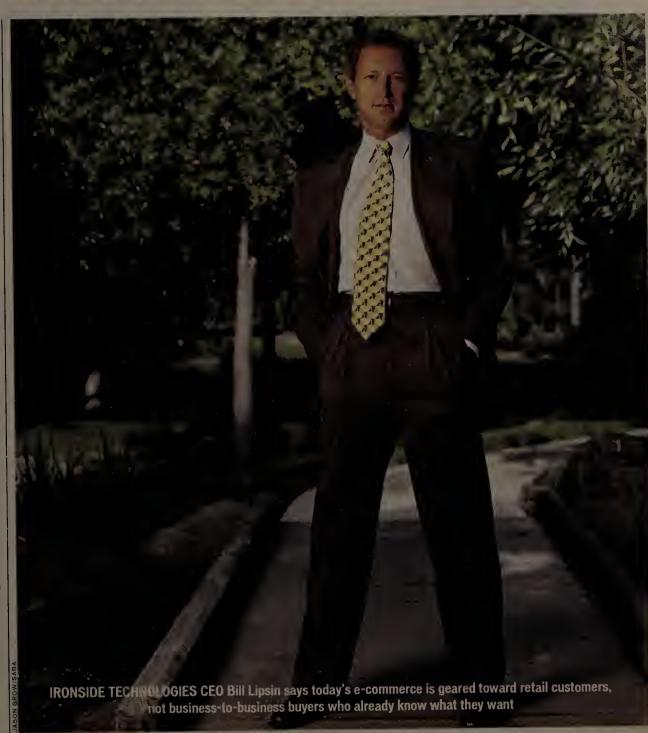
BEEP! DON'T FORGET KETCHUP

Web browsers on refrigerators, microwaves and gas pumps will keep IT managers busy developing new applications that will show up wherever consumers go. • 90

TELLING IT LIKE IT IS(N'T)

Speech recognition has come a long, long way, but there's more work to be done. Hardware deficiencies and extreme complexities of the typical Windows desktop are just some of the roadblocks. • 88

MORE	
Exec Tech	84
Flashback	
Hardware	
Networks	. 77,81
Skills Scope	93
Software	75



GET BACK TO BUSINESS

make it work — fast. Corporate buyers want online systems that build on existing supplier relationships, offer tough security and speed the ordering process. They don't want sales pressure and snazzy graphics. Start-up Ironside Technologies says its suite of tools provides the kind of sites that business e-commerce customers want.

E-Business Services BRIEF

E-Business Outsourcing: Prerequisite for Success

Strategizing, market analysis required by demanding users

Wendell Jones is an executive in the outsourcing business unit of Compaq Computer Corp., where he advises top management on a wide range of outsourcing topics. A leading practitioner of IT outsourcing as a customer and service provider, he is a frequent keynote presenter at the SMARTsourcing Conference Series. He is also co-author of the Prentice Hall book, Outsourcing Information Technology Systems and Services. During the course of our interview, he described the most important current e-business outsourcing trends.

CW: How has the rise of e-business fueled the outsourcing market?

JONES: The rise of e-business is propelling the outsourcing market because many companies are looking to develop an e-business capability, and they simply don't have the skills or the experience to do it on their own. They have to look to outside providers.

CW: How do you distinguish between e-business and e-commerce?

JONES: E-commerce includes business-to-business electronic transactions. E-business also includes all of your internal business processes—the value chain within your company, your internal business processes—as well as your suppliers and customers outside the company.

CW: How is e-business outsourcing different from traditional outsourcing?

JONES: Traditional outsourcing normally involved offloading your existing assets, outsourcing your data centers and legacy applications. It was most often to cut IT costs. Usually there was only a single outsourcing vendor, and the focus was on getting technology results and reducing costs. In contrast, what we see now is more emphasis on gaining access to enabling capabilities such as e-business. Now the focus is on Internet-based technologies and client/server based applications. Traditional outsourcing was more financially driven-cut costs, sell assets-and today it is more strategically driven. Important questions being asked today include, how can you get access to new markets, how can you compete in a new way, how can you reposition yourself in the marketplace? These are more strategic questions, unlike the more traditional emphasis on just financial considerations.

CW: So that means that outsourcing service providers have to have a lot more expertise. They're not just crunching numbers, writing code and operating computers anymore; they're helping develop business strategies.

JONES: You bet. They're helping companies figure out how to do business in a better way. How to compete. Look at the world today through the eyes of a typical CIO: The global business environment is volatile. There is intense global competition. Project delivery dates leave no room for error. Rapid time to market is a necessity. Your people and internal systems must quickly adapt to changing markets and changing technologies.

Management information has to flow between suppliers, customers, employees, partners and even partners that were formerly competitors—there are situations where in one case a company is your partner, and in another perhaps your competitor. Customers have high expectations. Outcourcing and sourcing relationships are just part of this bigger overall environment and ways companies are trying to compete in an intensely competitive, ever-changing business world. Increasingly, more and more companies are looking at outsourcing just like they do mergers, acquisitions, alliances and partnerships—as a way to better compete, a way to redefine the market, a way to reach new markets.

CW: Describe the current crop of e-business service providers.

JONES: Currently, leading E-Business service providers fall into one of the following groups: The first would be traditional IT outsourcers. Another group includes professional IT service providers who recognize that they need to support companies in the development and operation of their e-business capabilities. A third group is composed of start-up companies that are going specifically for the e-commerce and e-business market.

CW: Distinguish between these types of companies in terms of their strengths and weaknesses.

JONES: The general impression I'm getting is that there are companies that are good at the traditional outsourcing of legacy applications. Certainly you have to be able to link to your legacy systems, but you need more than just expertise in legacy systems. There are companies that have some experience in Web-enabling technologies, but lack much experience with legacy

IT applications. To me, the companies that are best positioned for e-business and e-commerce are those IT companies that provide the infrastructure and the platforms that cross a large spectrum of capabilities. With e-commerce or e-business, your customers can't have downtime. They need absolute reliability.

CW: Please explain that need for reliability in e-business.

JONES: First of all, if you have downtime, that particular transaction can be lost, but more importantly, you are probably going to lose that customer, because the customer will probably not have the patience to come back to you again. So you have to have absolute reliability of your underlying platforms and infrastructure.

CW: Have you heard any horror stories about e-business service providers?

JONES: I haven't heard horror stories, but I've heard from consultants who help put together deals that they are experiencing some difficulty in finding more than one or two providers with the full gamut of expertise and understanding that is necessary. As a result, we are going to see a continuing emphasis on partnering arrangements between providers—the best-of-breed approach.

Moreover, over the next couple of years, more and more companies will be using alliances, partnerships, mergers, acquisitions and sourcing relationships as ways to compete in different markets and as ways to more quickly adapt their companies. I believe we are going to see outsourcing of all types explode—IT outsourcing, business process outsourcing and e-business/e-commerce outsourcing—when companies stop spending on their Y2K remediation. There is a lot of pent-up demand for IT-enabled business capabilities that company IT budgets just could not support while still budgeting for the Y2K fix.

CW: How do conferences like SMARTsourcing help advance this knowledge in these areas?

JONES: At the SMARTsourcing Conference and Expo, there will be a wide range of presentations covering all aspects of outsourcing—from the nitty-gritty how-to approach all the way to strategic motivations driving companies to outsource. The SMARTsourcing Conference and Expo is a place where people can learn about many aspects of outsourcing and network with peers and colleagues.

Optimum Mix of Services Key to Future Success

Successful organizations will increasingly rely on external IT service providers in order to implement "best of breed" solutions, reduce implementation time and improve business processes. However, choosing the right strategic partner becomes increasingly difficult given the myriad available service options.

The SMARTsourcing Conference and Expo Series' goal is to provide business and IT professionals with a clear analysis of the latest sourcing models and expert insight into successful relationship management practices. The SMARTsourcing Conference Series is the only forum providing IT decision-makers with comprehensive coverage of the entire services landscape from traditional IT outsourcing services to the emerging E-Business service offerings.

Sessions will provide in-depth coverage of issues to be considered when entering outsourcing agreements, tips on getting the most value out of existing outsourcing relationships and partners, as well as the latest trends and available services including: CRM, ERP, Application Hosting, BPO, Application Development Outsourcing, Maintenance Outsourcing, Legacy Transformation, E-Strategy, and more.

Attend this three-day forum to gain expert insight from industry thought leaders, analysts, consultants and the world's leading solution providers.

To register, visit our Web site at www.brainstorm-group.com or call us at (508) 393-3266. Also visit our Web site for a complete agenda and list of presenters and to hear audio overviews.





SAP Prepares Rollout — Finally — of CRM Apps

Field sales, service packages first to ship. Will customers find them worth the wait?

BY CRAIG STEDMAN

AP AG HAS been slow on the draw with a promised line of applications for managing sales, service and marketing operations. But that's about to change, according to SAP.

At the German software vendor's Sapphire '99 user conference here this month, SAP executives said the customer relationship management (CRM) applications will finally start appearing this fall.

It's still expected to be late next year or early 2001 before the full 16-product CRM suite SAP has planned is available. But the company said applications for automating field sales and service operations should be ready for release in the next four weeks, three months later than the original schedule.

SAP also plans to start betatesting four more CRM applications this year, with shipments expected to follow by March. Those include packages for selling products online and letting customers check on order status and other information (see chart).

The CRM applications are a key part of SAP's attempt to reach beyond the back-office base of its R/3 enterprise resource planning software. Users who want SAP to handle their business application needs are waiting to see what the company comes up with in areas such | as CRM [News, Sept. 20].

Ed Toben, CIO at Colgate-Palmolive Co. in New York, said the maker of consumer products is helping SAP design a CRM module for synchronizing production schedules with promotions planned by retailers.

That module is due for a pilot installation at Colgate-Palmolive in February, Toben said. The company's business units currently set plans with retailers through a mix of "glorified spreadsheets" and phone, fax and e-mail contacts, he added.

But Colgate-Palmolive wants to use SAP's software to better coordinate that planning and to capture data for detailed analysis. Toben's goal is to link the CRM module to R/3 and companion data warehousing and supply-chain planning applications developed by SAP, he said. That would let Colgate-Palmolive avoid tying together applications from different vendors, he said.

Eastman Kodak Co. is another R/3 user that wants to start using CRM software early next year to deal with retailers and then eventually to take film orders from consumers over the Internet, said Eric Hunt, manager of an SAP-based data warehousing project at the Rochester, N.Y., company.

Hunt, a member of a fourperson team that leads planning related to Kodak's R/3 system, said SAP's CRM applications will be in the running.

But the question is whether SAP can deliver full-fledged products in time to meet Kodak's schedule, he added.

SAP trails rivals such as Oracle Corp. and San Mateo, Calif.based Siebel Systems Inc. in shipping CRM software.

However, heavy demand for

SAP's To-Do

Software that handles the following jobs is due for shipment or testing this year:

- Automating field sales and service operations
- Taking orders from customers via the Internet
- Letting customers check order status online
- Managing sales and service call centers
- Managing contracts with distributors and resellers

the software probably won't materialize until next year, said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Berkeley, Calif. And the tight integration to R/3 that SAP is promising gives users "a huge incentive to wait," he added.

MOREONLINE

For resources on SAP and customer relationship management, visit our Web site. www.computerworld.com/more

CYNTHIA MORGAN/COMMENTARY

And a teen shall lead their ERP efforts

OULD YOU TRUST your business to an enterprise resource planning (ERP) system installed by a teen-ager? California's Contra Costa County government did, and it paid off big-time. Putting college or even high school students to work on critical IT projects may also save the ailing computer science programs in our colleges and universities.

The neighboring Silicon Valley counties grab most of Contra Costa County; what little remains is often priced way beyond the county's budget. So when he discovered that the county's financial systems needed a Y2K overhaul, Deputy CIO John Forberg turned to one of the few reliable labor pools he had: students.

One 15-year-old proved adept at ERP and wound up the high-tech talent around building the county's entire PeopleSoft installation. Others worked with Contra Costa's IT department to switch older PCs to a thin-client system (Citrix Systems' MetaFrame) that boosted performance of the new ERP system.

Forberg brought critical projects in on time and under budget. The students received real-life, well-paid IT experience they'd never get

Contra Costa County's approach could cure one of the worst double-edged swords hanging over our industry: a serious labor shortage com-

pounded by falling computer science enrollments and curricula that simply can't keep up with the real world.

I'm not saying every computer program out there is failing; they're clearly not. And a good grounding in basic computer science is certain-



CYNTHIA MORGAN is Computerworld's tech nology evaluations editor She can be reached at cynthia_morgan@ computerworld.com.

ly not a waste of time. Many top colleges offer up-to-date, well-balanced programs in theoretical and practical computer work.

But they supply the cream of the crop, not rank-and-file IT workers. Humbler schools may dismiss Web development as vocational education. They have trouble keeping up with technology that may rise and die in the space of one semester.

A Middle Tennessee State University study surveyed 186 colleges and universities with undergraduate infor-

> mation systems programs and found that curricula haven't changed much since 1995. The most commonly required programming language? Cobol. Business and management courses were rare.

IT job candi-

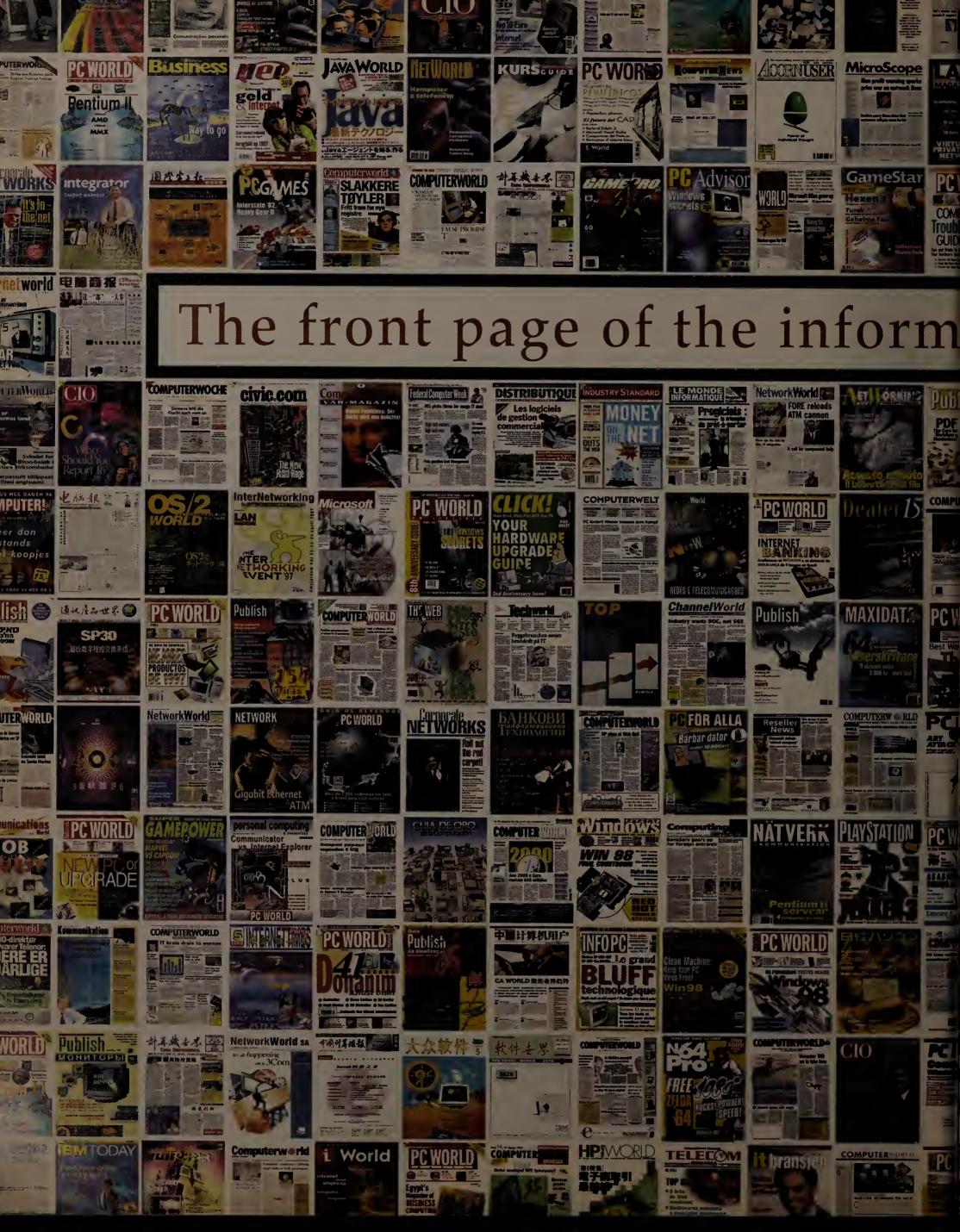
dates will come out of those places seriously unprepared. If we can't cajole — or fund — schools into more appropriate curricula, we'd better come up with serious apprentice programs, à la Contra Costa County, to give these students useful skills. Co-op programs don't reach far enough.

What would happen if universities made a year's worth of hands-on, paid IT practice a graduation requirement? What if corporations and universities combined with governments, schools and charitable organizations to build an internship system that cured public-sector IT shortages while it gave students practical experience and built a labor force that could cope with corporate demands?

I think it could work. I'd love to hear why not.

MOREONLINE

For resources related to enterprise resource planning, visit our Web site. www.computerworld.com/more





電腦世界

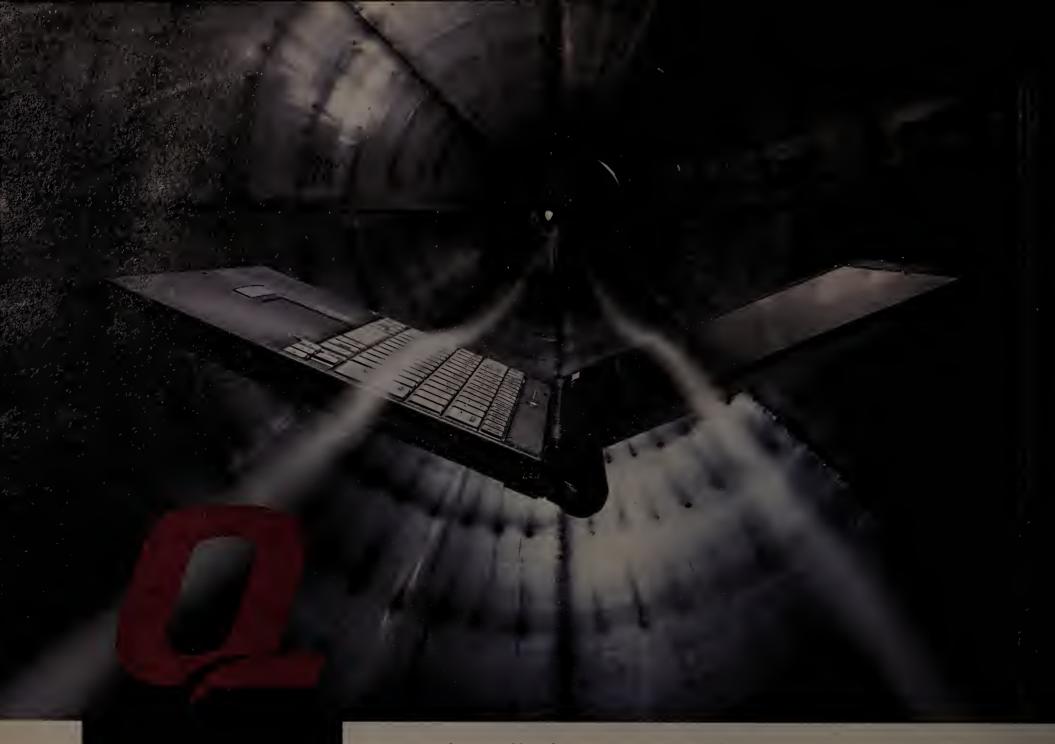
VKCIO

az ablakban

COMPUTERWORLD

PC WORLD

아이테크정보



Streamlined?

Yes, and totally fine-tuned. In fact, we've reengineered the whole Compaq Armada Series to travel better. So it gives everyone in the enterprise nonstop computing convenience, no matter what part of the globe they happen to be computing from. The Compaq Armada family is lighter, with new rounded edges for easier packing. Open

it, and the intelligent design continues, with colored key buttons that are easy to identify, and a new, ergonomic palmrest. Not to mention the high quality and reliability that help your company run nonstop—in the office or on the road. Details? Call 1-800-AT-COMPAQ, or visit www.compaq.com/armada.





TECHNOLOGYS

SAP '99: No More Vanilla Apps, But a Little of Floyd

BY CRAIG STEDMAN PHILADELPHIA

SAP AG's Sapphire '99 conference, held here earlier this month, included plenty of serious-minded sessions on the software vendor's applications and what users are doing with them. But there were lighter moments, too, such as the

■ SAP Co-CEO Hasso Plattner started his keynote speech by quoting some old Queen songs and then said he wants to

use the company's new portal-style user interface "to own the desktop." Just minutes later, the smiling

face of the current desktop owner, Microsoft Corp.'s Bill Gates, was beamed onto screens in the hall via a satellite feed. Gates studiously avoided the issue of desktop control, other than to tell Plattner it was "very exciting to see how you've enhanced the interface there."

■ Attendance at the conference was about 13,000, down from the 15,000 people who showed up at last year's extravaganza in Los Angeles. But that was planned, said Kevin McKay, CEO of SAP's U.S. subsidiary. SAP tried to restrict attendance more than it did in the past, in part because space was limited in Philadelphia. It also didn't try to replicate the dancers and marching band that took part in Plattner's L.A. keynote. "This isn't Hollywood," Mc-Kay explained.

■ During one session, Eric Hunt, man-

ager of Rochester, N.Y.based Eastman Kodak Co.'s SAP-based data warehousing project, lamented the loss of his ability to just throw in bug fixes and see what happens now that the software is actually being used by workers at the company. But he brightened when asked how he keeps pesky end users from trying to build their own data analysis cubes. "I own the training materials, and I don't give them out," Hunt joked.

"That's about as good as it gets."

■ In another session, CIOs from a halfdozen retailers that use SAP R/3 discussed how the Internet is changing their business. Honorio Padron, CIO at CompUSA Inc. in Dallas, said the company is trying to avoid customizing its R/3 system so the software stays as vanilla as possible. But no one's perfect: The project team passes around what it calls the VMA trophy, which Padron said stands for "Vanilla, My A--." The R/3 system ended up "more like"

vanilla with sprinkles," he added. ■ In the same session, Jake Mendelsohn, CIO at Phoenix-based pet-supply retailer Petsmart Inc., was talking about the perils of doing business online when one of his fellow panelists noted that at least people usually don't try to return dog food. "You'd be surprised,"

Mendelsohn deadpanned. ■ The group in charge of stabilizing SAP's version of R/3 for apparel and footwear makers has come up with a

> new twist on the split between the back and front offices. In its case, "back office" refers to the devel-

opers who are working on the software at SAP's labs in Germany, said Annegret Sonnenberg, the company's vice president of retail and consumer products. The front office consists of other developers and consultants who were assigned to work on fixes at user sites, she

■ Sources said SAP tried to get Bruce Springsteen to play at its big outdoor Sapphire bash, but the Boss wasn't biting. Instead, rain-soaked attendees got to hear Earth, Wind & Fire and a socalled "all-star" band that included exmembers of hoary bands such as the Eagles, Steppenwolf, Toto and Foreigner. Other musicians playing for corporate rates at vendor-sponsored parties included Donna Summer, the Steve Miller Band and the B-52's.

■ Plattner was a veritable man of the people at the conference. He was spot-

We just want to

be an Internet

company.

That's the basic

message.

HASSO PLATTNER,

ted several times chatting with small groups of attendees in the halls of the convention center or on the exhibit floor. McKay said both he and Plattner were trying to spend less time cooped up in meetings so they could get out on the floor and take the pulse of the users there. The executives usually talk a lot of business with other vendors and consulting firms during Sapphire, but not this year. "We told our partners

at the kickoff reception that we'd see them after the conference," McKay

■ In the age of e-commerce, selling enterprise resource planning applications just isn't as sexy as it used to be. Asked during a press conference how users should view SAP nowadays, Plattner was quick to push the dot.com button. "We just want to be an Internet company," he said. "That's the basic message."

■ Hurricane Floyd slid past Philadelphia on the last day of the conference, closing the airport and throwing everyone's travel plans up in the air (so to speak). The announcement that the air-

port had shut down set off a mad rush to find hotel rooms for an extra night. Even workers from SAP's U.S. headquarters outside the city had trouble getting to their suburban homes — road flooding led the local government to issue an advisory against driving.

Come and Source at the Most Influential IT and Telecommunication Event in China!



China Hi-Tech Fair 中國國際高新技術成果交易會

Shenzhen, PR China

ComNet Shenzhen '99

國際計算機、通訊、網絡展覽會

: 6-10 Oct 1999 Venue : China Hi-Tech Fair Exhibition Centre,

The event that you shouldn't miss!

- With 30+ exhibiting delegations, hundreds of local and overseas exhibitors, over 40,000 sqm exhibit area, China Hi-Tech Fair is the largest technology event in China.
- As the IT and communication pavilion of China Hi-Tech Fair, ComNet Shenzhen will be showcasing latest products and service in the computer, networking and telecommunication technology, products and services.
- 30+ conference sessions on e-commerce, networking, telecommunications, enterprise solutions, etc, plus Keynote presentations by IT heavyweights from Lucent, Microsoft, IBM, Nortel and National Semiconductor.

Online and Visitor Registration: www.comnet.com.cn Enquiry: comnet@idg.com.hk

- Ministry of Information Industry, PR China Ministry of Foreign Trade and Economic Co-operation, PR China Ministry of Science and Technology* PR China
- China Academy of Science Shenzhen Municipal Governm

To: ComNet Shenzhen

CWHK

Business	Reply	Slip

I would like to visit ComNet Shenzhen. Please send me more information.

Address: Postal Code: Country: Tel: Date: E-mail:

PC Vendors Boost Thin-Client Lineups

New offerings support more platforms, including Windows NT and Linux

BY CYNTHIA MORGAN

C MANUFACTURERS are getting into the thin-client game in a big way. Companies such as Hewlett-Packard Co. and Compaq Computer Corp. have announced thin clients, while traditional big-iron and terminal makers such as IBM are boosting their thin-client offerings.

That's good news for information technology managers, who have been chafing at restrictions of existing products, such as low-resolution graphics, limited memory and relatively high prices.

Not Quite Right

"We still don't think we've found the perfect terminal," said Adam S. Fogelman, manager of network project services at The Cleveland Clinic Foundation's IT division.

"All have some disadvantages for our applications. The newest Windows CE devices do look promising, ... but we've only started to investigate them."

Unlike the client/ server model, where applications reside on the client and draw data from the

server, a thin client's applications and data are usually housed and executed on the server. Thus, thin-client machines need few moving parts and only enough data storage to run the system itself.

Manufacturers have replaced traditional dumb terminals with sleek new clients that can run on network platforms such as Windows NT, Win-

dows NT Terminal Server Edition and Linux and other flavors of Unix. The client's operating system may be Windows CE or Linux; they will often use Web browsers to access server-based applications.

Thin-Client Growth

IBM'S SERIES 2800 Network Sta-

tion adds management and connec-

tivity options to the existing line

International Data Corp. in Framingham, Mass., estimates that as many as 6 million new thin-client machines will ship by 2003. Gartner Group Inc. estimates the number of thinclient seats - including PCs accessing server-based appli-

cations — will reach 30 million | by 2002. The reason, according to a Gartner report, is that, overall, "thin clients are 20% to 35% less expensive to operate" than LAN-based PCs.

Compaq's machines, which will hit the market early next month, will support Microsoft Corp.'s Windows Terminal Server Edition and Citrix Systems Inc.'s MetaFrame client access system. Prices and other details haven't been announced.

HP will introduce its new Entria thin-client line over the next few months. These machines will support Windows NT Terminal Server Edition, Citrix MetaFrame or Linux. Pricing will range from \$559 to

\$799, without monitors.

IBM is also shipping two new series of thin clients, the Series 2200 and 2800 Network Station lines, starting at \$559 and \$799, respectively. The 2200 targets data-entry workers, while the 2800 adds memory, expansion-card and device-connection options that let it operate with more demanding applications.

One newcomer, Netier Technologies Inc., will sell its Linux-based NetXpress machine for \$645. The Carrollton, Texas-based vendor has added IP videoconferencing capabilities to its high-end SL2000 thin clients, which will sell for just under \$2,000. D

IBM Introduces ThinkPad Line With Bigger Displays

Remote management features a hit with IT

BY MATT HAMBLEN

IBM last week introduced its first 15-in. laptop display as part of its ThinkPad 390X line-

Several information technology managers praised the lineup's remote administration capabilities, although one wondered if executives who make presentations would find a laptop that weighs almost 8 lb. appealing, even with the large display.

The line includes three models that start as low as \$1,999 for a 12.1-in. display, running a 400-MHz Mobile Celeron processor.

The model that features a 15in. display includes a 400-MHz Mobile Pentium II processor and sells for \$2,999. A model

cludes a 400-MHz Mobile Pentium II and costs \$2,799. The new notebooks weigh upward of 7.6 lb., nearly 3 lb. heavier than IBM's popular ThinkPad 600 model.

Roger Green, CIO at Cymer

15-in. display might be valuable for sales presentations, but he added that he doubted executives would want to carry the extra weight, "which is why they have the lighter 600s," said Green. Cymer makes lasers used in silicon chip production and uses about 100 ThinkPad 600s for executives and another 100 390E models for field technicians. Cymer's field technicians use a cart to transport equipment, so the extra weight isn't that important, he added. Green said the 390Es have performed flawlessly, which is critical to his field support team's function, which is to keep lasers used to make chips operating around the clock.

Remote Administration

Green and Pam Horrocks, technology coordinator at Ribet Academy, a private high school in Los Angeles, said

> tration abilities IBM has provided with its laptops, allowing remote updates of drivers and applications.

Horrocks said the 390X's 15-in. display might be attractive when Ribet buys more laptops next spring.



Inc. in San THE THINKPAD 390X features Diego, said the IBM's first 15.-in laptop display

Don't Blame Back Orifice For Security Problems

Expert says lax security practices, not cool hacking tools, are the real threat

ACK ORIFICE is a remote administration tool for Microsoft Windows and, as Bruce Schneier, chief technology officer at San Josebased managed security services firm Counterpane Inter-Security Inc. (www. counterpane.com), points out, "one of the coolest hacking tools ever developed."

reporter Computerworld Ann Harrison spoke with him recently about the tool, which he insists has gotten an undeservedly bad reputation.

Back Orifice 2000 (BO2K) is free, open source and available at www.bo2k.com.

Q: How does BO2K work?

A: There are two parts: a client and a server. The server is installed on the target machine. The client, residing on another machine anywhere on the Internet, can now take control of the server.

This is actually a legitimate requirement. Perfectly respectable programs, like pcAnywhere or Microsoft [Corp.'s] Systems Management Server [SMS], do the same thing. They allow a network administrator to remotely troubleshoot a computer. If the server is installed on a computer without the knowledge or consent of its owner, the client can effectively "own" the victim's PC.

Q: Why has BO2K acquired a reputation as only a hacker's tool?

A: Back Orifice's difference is primarily marketing spin. Since it was written by hackers, it

That's wrong; pcAnywhere is just as much an evil hacking tool as Back Orifice.

Not only can the client perform normal administration functions on the server's computer — upload and download files, delete files, run programs, change configurations, take control of the keyboard

and mouse, see whatever is on the server's screen — but it can also do more subversive things: reboot the computer, display arbitrary dialog boxes, turn the microphone or camera on and off, capture keystrokes and passwords [Technology, Sept. 20]. And there is an extensible plug-in language for others to write modules.

Q: How does BO2K run in stealth

A: Unless the server's owner is knowledgeable (and suspicious), he will never know that Back Orifice is running on his computer.

Other remote administration tools, even SMS, also have stealth modes. Back Ori- | faux pas before anything else

fice is just better at it.

Because Back Orifice is configurable, because it can be

and then recompiled to look different...I doubt that all variants will ever be discovered.

BO2K's slogan is "show some control," and many will take that imperative seriously. Back Orifice will be used by lots of unethical people to do all sorts of unethical things. And that's not good.

Q: Back Orifice can't do anything until the server portion is installed on some victim's computer, right? A: Yes. This means that the victim has to commit a security

BRUCE SCHNEIER:

Being prepared is the

best defense against

security breaches

can happen. Not that this is very hard — lots of people network their computers to the Indownloaded in source form ternet without adequate pro-

tection.

Still, if the victim is sufficiently vigilant, he can never be attacked by Back Orifice.

Q: What about Microsoft?

A: One of the reasons Back Orifice is so nasty is that Microsoft doesn't design its operating systems to be secure. It never has.

In Unix, an attacker would first have to get root privileges. Not in Windows. There's no such thing as limited privileges or administrator privileges or root privileges. This might have made some sense in the age of isolated desktop computers. But on the Internet, this is absurd.

There are provisions to make Windows NT a very secure operating system, such as privilege levels in separate user accounts, file permissions and kernel object access con-

You have to make 300-plus security checks and modifications to Windows NT to make it secure. Microsoft refuses to ship the [operating system] in that condition.

Malicious remote administration tools are a major security risk. What Back Orifice has done is made mainstream computer users aware of the danger. There are certainly other similar tools in the hacker world — one, called BackDoor-G, has recently been discovered — some developed with much more sinister purposes in mind.

Microsoft responds to security threats only if they are demonstrated. Explain the threat in an academic paper and Microsoft denies it; release a hacking tool like Back Orifice and suddenly they take the vulnerability seriously.

Gigabit Ethernet a Hit At Networld/Interop Show

Interoperability among vendors could spur lower-cost, high-speed networks

BY JAMES NICCOLA!

Gigabit Ethernet over copper wiring was high on the agenda at Networld/Interop '99 earlier this month, where vendors, including 3Com Corp., Extreme Networks Inc. and Intel Corp., offered the first public demonstration of their products interoperating with one another.

The technology is expected to allow businesses to build Gigabit Ethernet networks using existing so-called Category 5 copper wiring, saving organizations the expense of rewiring their buildings with fiber-optic cables.

Users who saw the technology demonstrated here said the potential cost savings attracted them the most.

"I'm looking at it mainly for the price," said Jeff Bailey, a LAN specialist at Kent State University in Ohio. Kent State wants to use the information technology to link a cluster of Pentium III PCs for running parallel applications, he said.

Lower Price Tag

Besides the likely savings in infrastructure costs, copper Gigabit Ethernet equipment is expected to be priced lower than its fiber counterpart. For example, Alteon Web-Systems Inc. showed a 1000Base-T adapter for copper, which the company plans to ship in November for \$495. That price compares with \$995 for Alteon's Peripheral Com-

Interconnect-based ponent fiber adapter, a company official said.

Members of the Gigabit Ethernet Alliance are pitching the technology not just as a way to link servers, but also for use in backbones and to connect switches less than 100 meters apart — which is the current maximum distance at which copper Gigabit Ethernet will operate. Users here said they are likely to deploy the technology to build server farms, and a few were skeptical of using copper Gigabit Ethernet elsewhere.

"I absolutely would not use this in a backbone," said Mark Tillman, manager of network services at the digital division of print services firm World Color, in Greenwich, Conn. I wouldn't go even 10 feet switch-to-switch."

Tillman said he's worried about possible radio frequency interference - although vendors here insist that won't be an issue.

More than that, Tillman said, he's concerned about what his manager would think if he used the new technology in such a vital part of the company's network.

The interoperability demonstrations followed simple ones given at the Networld/ Interop show in Las Vegas in May, where Alteon, Extreme Networks and other vendors showed products working separately. Many of the switches on display combined ports for fiber and copper, letting companies build hybrid networks.

What's the Plan?

An IT director at Pennsylvania State University said he would like to see vendors be more specific with their plans to offer products that will enable him to build an all-copper environment.

Penn State needs the gigabit bandwidth to link servers that store digital video school's public television station. The university is planning for its next fiscal year and needs to know now what products are on the horizon, said Jeff Luck, director of outreach information systems at the university.

Niccolai writes for the IDG News Service in San Francisco.

TECHNOLOGY REVIEW

BUSINESS SOLUTIONS FOR INFORMATION SYSTEMS

Set a Course to Business You Can Get There From Here

o launch into the e-world, you don't need to look farther than your existing Cobolbased IT infrastructure.

Organizations are busy building e-business solutions — those that combine the reach of the Internet with the vast resources of traditional IT systems. Spending on such technology initiatives will reach \$43.6 billion worldwide by 2002, according to research on Internet and e-commerce site development from IDC. The draw for these firms is to be able to open new markets, improve their bottom lines, increase their competitiveness, offer 24/7 availability and elevate customer satisfaction. But the fundamental question facing all IT executives and managers when contemplating online initiatives is how best to proceed from where they are today to their desired destiny in cyberspace.

Choosing the right path — the one with the most cost-effective and performance-savvy

solution — can make or break an e-business initiative. As IT organizations assess enterpriselevel e-business options, there's no shortage of voices advocating that they build totally new systems from the ground up. New architectures such as COM, ActiveX and CORBA, after all, were developed with distributed computing in mind. These architectures may offer the optimal approach for start-up companies that are just entering the market, but the fact is that most established organizations have an incalculable investment in their existing Cobol-based IT

assets. Discarding reliable and often mission-critical systems in favor of a "fresh start" just isn't wise for most IT organizations. More important, it may not be necessary.

The best approach for IT organizations may be to find a way to take advantage of the new



Excerpted from Sept. 6 special advertising supplement. in Computerworld. For reprints e-mail heidi_broadley@cw.com.

architectures while leveraging their valuable business applications, data and back-end systems.

Getting the most from what you already have is the motive for organizations choosing to leverage Cobol code running core business applications. Advantages of doing so include risk reduction, time to market, systems integration, return on investments, availability of in-house staff resources and the ability to extend existing application knowledge into the Internet realm.

These risk factors can have a impact on your time-to-market as well. There is an urgency to get

Web-based business systems up and running quickly.

Systems with the mainframe — opens up a broad range of interesting possibilities, and additional challenges for the IT decision maker. According to IDC, only about 10% of new e-business systems are actually integrated with back-end systems. It's one thing to set up a server to handle Web access, and quite another to enable a client browser to interface with various data and applications on the mainframe.

From airline reservations to insurance claims processing, most large IT organizations have a tremendous investment in mainframe-based computing systems that are running their business today. They can't afford to walk away from those systems.

The trick is to continue leveraging the underlying business logic running on firmly established computing systems while presenting an attractive front end to users at the desktop. By doing this efficiently, organizations can achieve a reasonable return on investment on current IT assets as they embark on e-business initiatives.

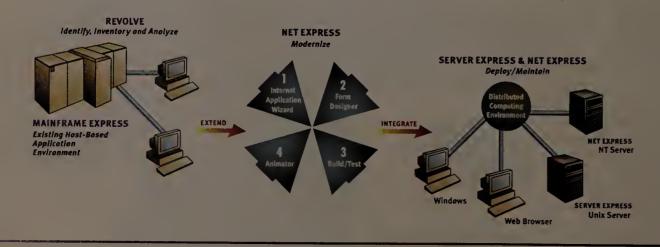
The Migration Process at a Glance

MERANT bridges legacy assets to e-business applications.

Successfully extending existing Cobol-based systems to the Internet means marrying Web and component technology to the traditional values of the enterprise: reliability,

availability and scalability.
Mountain View, Calif.-based
MERANT offers solutions that
specifically combine the
Internet and traditional Cobolsystems employing the bene-

fits of a Windows platform, graphical user interfaces, and object-oriented development and component technology, as well as mainframe and data connectivity.



Produced by: COMPUTERWORLD

Discover A Shortcut

On Your Path To e-Business

Free Half-Day Seminar

Application Extension For e-Business

Learn To Leverage Your Investment

In Mainframe-Based Systems

Register For This Free Seminar Today!

Phone: 1.800.632.6265 x335

Fax: 1.888.874.4279

www.merant.com/seminars/ebusiness

One Olympus Digital Camera Will Be Given Away In Each City.

Re-Tool For e-Business In Internet Time

e-Business will test your company's ability to change and change quickly. But that doesn't mean starting over. If you've been relying on mainframe-based systems, discarding mission-critical applications in favor of a "fresh start" could introduce unforeseen roadblocks.

Computerworld's Enterprise Business Solutions Group and MERANT Micro Focus invite you to learn how your peers are deploying existing business applications to platforms such as UNIX, WindowsNT and the Web—without re-training or employee turnover.

Featuring a presentation from GIGA Information Group, "Application Extension For *e*-Business."

Join us and receive a roadmap to avoiding obstacles and learn how your company can gain a competitive advantage. Register for this free seminar today.

Boston September 28 Toronto September 29 Houston October 6 Los Angeles October 7



Learn

experts tackle the

THEN

network storage

Announcing The 2nd Annual Network Storage Symposium in Scottsdale, Arizona

Cutting-edge solutions to the problems that make users bristle.

Register for the Network Storage Symposium 2000, February 10–12, to learn more about the hottest technology of the new millennium: Network Attached Storage (NAS).

Informed opinions and insights from NAS experts. Join industry luminaries such as Michael Peterson of Strategic Research, Kimball Brown of Dataquest and Robert Gray of IDC as they examine current issues and trends as well as strategies for NAS implementation.

Two days of innovative solutions, one day of serious fun.

Days one and two will cover a wide range of NAS topics and include scheduled receptions plus evening festivities. Day three is filled with exciting activities including: golf, horseback riding, river rafting, and Hummer or Jeep desert trips.

Reserve your space now.
Gain a broader knowledge of NAS, meet new friends and industry contacts, and share a unique experience that will keep you looking forward to next year's symposium. See below for details.







Network Storage Symposium 2000

February 10-12, 2000 at The Scottsdale Plaza Resort

AXIS COMMUNICATIONS

Get complete details et www.axis.com/symposium2000 or call 1-800-294-9614 to register

TECHNOLOGYNETWORKS

Divide and Conquer Delivers Web Uptime

BY JAIKUMAR VIJAYAN

Onsale Inc. is combining datacenter-like reliability measures with a highly distributed application architecture to keep its e-commerce site up and growing in Internet time.

A little more than four years after launching the site, the Menlo Park, Calif.-based online distributor of electronic goods averages less than 20 minutes of planned and unplanned downtime per quarter, claimed Alan Fisher, a cofounder of the company.

"The barrier to leaving an online site is just a couple of mouse clicks away," so online companies have to ensure uptime, said Robert Lynch, CEO of ClearCommerce Inc., a provider of security services for online credit-card transactions.

Much of Onsale's high uptime level is the result of an architecture designed to grow at warp speed without sacrificing basic reliability. Fisher said.

Both the code and the functionality of Onsale's main e-commerce application is split into 64 components, each of which can be upgraded or repaired without bringing down the whole complex.

A custom application programming interface written by Onsale allows each of the components to communicate with each other as well as the underlying Oracle Corp. database running on Windows NT. The company has four different backup procedures in place to minimize accidental data loss.

Two mirrored, quad-processor Dell Computer Corp. servers with mirrored Clariion RAID storage subsystems from Data General Corp. run identical copies of the company's primary database. If either of the application servers or storage subsystems fails, the other will instantly take over. An identical hot backup server 30 miles away allows Onsale to provide nearly uninterrupted service in case both systems fail at the primary location.

Onsale has built a two-hour delay for copying transactions in to the remote backup system to minimize the chance of major human-induced data errors being copied into the remote server, said Fisher. All daily transactions are copied into two identical off-line backup servers and databases every

night. In addition, each night the database is backed up onto digital linear tapes that are then stored at a remote site.

A team of 10 quality assurance professionals assists the 25-person primary software development team in rolling out

enhancements and new Web site features. Although the emphasis is on speed and incremental upgrades, the company sticks to detailed design specifications and testing procedures, Fisher said.

Because of all the timeto-market considerations, "a shoot-from-the-hip development style" just won't work, Fisher said. At least five professionals constantly monitor the site for problems.

Get Connected at

"Storage Networking World™!

October 19-21, 1999 • Renaissance Madison • Seattle, Washington



Storage Networking promises to change the way user companies deploy their storage and networking solutions. To prepare for this journey, IT Leaders from corporations nationwide along with industry storage networking professionals will join their peers, thought leaders and key solution providers at the Storage Networking World" Conference and Expo, October 19-21, 1999 in Seattle!

A Critical Learning **Opportunity for IT Managers**

This special learning event will provide clarification for IT users on the management strategies and issues surrounding:

- Storage Area Networks (SAN)
- Storage Resource Management (SRM)
- Network Attached Storage (NAS)

Get on the Fast Track With the Leaders

With two jam-packed days in October, you can help set your company strategy for the Millennium. In this unique industry and corporate IT user conference, you will have the opportunity to network with hundreds of your peers and storage networking professionals and hear and see the latest technology developments, deployments and a vision for the future. Don't miss the opportunity to develop key industry relationships as Storage Networking heats up!

Platinum Sponsors

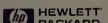
Compaq StorageWorks

VERĪTAS

Gold Sponsors



Additional Sponsors



HEWLETT HITACHI



Register Before October 8th and Save!

REGISTRATION TYPES	Fre-Registration (before Oct. 8th)	On-Site Registration (before Oct. 8th)		
SNIA Voting Members	\$895 (\$75 for expoldinner only)	\$995 (\$100 for expo/dinner only)		
SNIA Associate Members	\$995 (\$75 for expoldinner only)	\$1,095 (\$100 for expoldinner only)		
All others	\$1,095 (\$75 for expoldinner only)	\$1,195 (\$100 for expoldinner only)		
One-Day SAN Technical Tutorial	\$645 additional	\$695 additional		

Special \$169 per night room rates are available at The Renaissance Madison by calling (800) 278-4159. (Special rate expires September 27.)

or more information, sim	ply fax this complete	ed form to: (508) 626-8524
--------------------------	-----------------------	----------------------------

Name:		Title:	
Company:			
Street Address:		City/State/Zip:	
Phone:	Fax:	E-mail:	

For more information, or to register online or by phone, visit www.computerworld.com/snw or call 1-800-343-6474 x8652.

Storage Networking World is produced and co-owned by Computerworld and the Storage Networking Industry Association (SNIA).

TECHNOLOGYEMERGING COMP

Ironside's Ironworks Proves Magnetic

Start-up offers corporate e-commerce package for business-to-business world

BY AMY HELEN JOHNSON

USTOMERS of W. B. Mason Co., a major independent officesupply company based in Brockton, Mass., were clamoring for an online ordering system. But the last thing they wanted was a flashy Web catalog.

W. B. Mason sells businessto-business, and that kind of customer knows exactly which folder to order, says Peter Dupre, the company's CIO. Such customers have been buying the same set of supplies for years and probably have the item numbers memorized. It was important that the Web site be fast and the software "know" all the details about the customer — the shipping address, account number and special pricing negotiated with W. B. Mason.

Those requirements were tough because they meant W.B. Mason's e-commerce software had to be able to access the customer information stored in its back-end systems without wasting a lot of time on the query. Dupre chose Pleasanton, Calif.-based Ironside Technologies Inc.'s Ironworks e-commerce platform and says he couldn't be happier.

"We've been able to not only keep customers [in the more than \$1 million-per-year category], but we've also won a tremendous amount of new business," Dupre says.

E-commerce didn't address the business-to-business market when Ironside began in early 1996, says Bill Lipsin, the company's president and CEO. It was geared toward consumer-oriented products.

Lipsin identifies three things that differentiate a corporate customer from a consumer: ■ Corporate customers have existing relationships with their suppliers and expect those suppliers to be aquainted with certain details, like the company's credit rating and shipping preferences.

■ Security is paramount because companies don't want competitors to know things like purchase plans and terms they have with suppliers. ■ A purchase is just an item to check off on a to-do list - not a recreational experience — so make the process fast and easy.

Ironworks addresses these needs by linking directly into midtier enterprise applications — like those from J. D. Edwards & Co. in Denver, Marcam Solutions Inc. in Newton, Mass., System Software Associates Inc. in Chicago and Acepac International in Pleasanton, Calif. — so it can use a corporation's business rules and customer information. Ironworks also taps into the existing logistics system so order fulfillment and tracking is avail-

IRONSIDE CEO BILL LIPSIN: The trick to making business-tobusiness commerce work is keeping it simple and sales-pitch-free

Ironside Technologies Inc.

Location: Pleasanton, Calif.

Telephone: (800) 495-4766

Web: www.ironside.com

Niche: E-commerce software for manufacturers and distributors

Growth potential: It's e-commerce - 'nuff said.

Why it's worth watching: Flagship product Ironworks hooks into enterprise resource planning systems and uses the company's established rules to build a businessto-business commerce package.

Company officers:

- Bill Lipsin, president and CEO
- and vice president of business development
- Andrew Siks, co-founder and vice president of product development

Company goal: "If you look at who we view the competition to be, our benchmark is the tele-

phone," says Derek Smyth, senior vice president of marketing.

Milestones:

- 1996: Founded
- 1997: Ironworks Version 1 released; new version due soon.

Employees: 94

Burn money: General Electric Capital Corp., Euclid Partners, Working Ventures Canadian Fund Inc., Beamscope Canada

Customers: Production Tool Supply, W. B. Mason Co., Mother Parker's Tea & Coffee, Minolta Corp., Paradyne Corp.

Red flags for IT:

- Business-to-business e-commerce is the new El Dorado; competition gets keener by the minute.
- Customers complain that their catalogs lack pizzazz; Ironside hopes the new releases will give them that graphics sizzle.

able to Web customers.

Scott Latham, an analyst at AMR Research Inc. in Boston, says Ironside's relationships with enterprise-application vendors is a key advantage. "If you're a user with one of those applications, Ironside is the best choice," he says.

Latham also praises Ironside's use of Java, Extensible Markup Language and thinclient technology: "To use a cliché, it's built for speed."

Ironside has carved out a midtier niche among manufacturers and distributors that have tens of thousands of items for sale. At Production Tool Supply (PTS), an online retailer of industrial equipment and supplies in Warren, Mich., the catalog contains 200,000 items. PTS sells almost exclusively through distributors; its Ironworks e-commerce site was designed to make life easier for those distributors.

Building the PTS Web site took some work, says Mark Kahn, the company's president. "The most difficult part of the process is developing the gateways between our [JBA International Inc. System 21 enterprise resource planning] system and Ironside," he says.

Kahn has already spotted his return on investment. Though the site is still in the test stages, Kahn says he can see that PTS

will save money, because online orders are more accurate than phone and fax orders, which have to be entered into the system by office personnel. As the company's distributors use

the online system more, Kahn can eliminate some of the phone positions now needed to support distributors.

Ironside has only about 100 customers, but at approximately \$100,000 per installation, the company is staying afloat. It has several direct competitors in the midtier business-to-business market and can expect more as vendors start listening to analysts' predictions about the size of this potentially lucrative e-commerce market. If those predictions come true, Ironside will be ready, Lipsin says. "When we see the e-commerce market kick into gear, we're going public," he says.

Johnson is a technology and business writer in Seattle.

the buzz STATE OF THE MARKET

Fighting the **Telephone**

Derek Smyth, Ironside Technologies Inc.'s senior vice president of marketing, says the company's real competition is the telephone. Ironside's customers also have catalog phone-sales systems. If their Ironworks-powered e-commerce system can't get customers to put the phone down, the Web site is a failure.

Ma Bell aside, there are some companies that want a slice of the businessto-business e-commerce pie. Here's how they rate against Ironside:

Commerce Exchange

InterWorld Corp.

New York

www.interworld.com InterWorld's Commerce Exchange is similar to Ironworks. It links to enterprise applications using "process-centric computing" and "business adapters." AMR Research's Scott Latham says fronworks integrates better into an infrastructure, but Commerce Exchange has better process design tools.

LiveCommerce

Open Market Inc. Burlington, Mass.

www.openmarket.com

Ironside sees Open Market as a competitor, but Latham doesn't. Open Market customers have revenue of more than \$1 billion. Ironside stays in the midtier, Latham says, serving companies with revenue between \$25 million and \$1 billion. "If those two encounter each other in a customer situation, one of them shouldn't be there," he says.

Segway

Signal Internet Technologies Inc. Pittsburgh

www.segway.com

Signal is "a worthy competitor," Latham says. The company recently restructured, so he can't make a direct comparison to Ironside. Signal's Segway used to be the leader in Ironside's market, but "it looks like Ironside has caught up and passed them in market presence," he says.

Order Manager

SpaceWorks Inc. Rockville, Md.

www.spaceworks.com

SpaceWorks' Order Manager has similar features – a business-to-business Web sales site that hooks to enterprise resource planning (ERP) and electronic data interchange systems - but Latham says Ironworks is better designed for integration with midtier ERP vendors.

- Amy Helen Johnson

ROCK THE BOAT. BUCK THE SYSTEM. QUESTION THE STATUS QUO.

SEND US YOUR IT LEADER STORY

MANAGERS toiled away

on say behind the scenes. The job

lea for little more than keeping

ame Lumming.

at the heart of their organizations. They've med the authority to make strategic decisions and to drive competitive advantage for their companies.

LTD LE 1 STORY

N wspaper for IT

Computerworld

onstantly on the
lookout for techlooy stories

unctuated with
an extraordinary
impact on the
loottom line. If you
live a success story of
low own to share, send it to
units lect number of entries will
loof of filed in Computerworld.

CITY PRIZE

lucky entrant will be awarded an IT Leader leather jacket to wear to his heart's content and to his peers' envy.

Email your story or request for more information to IT_Leader@computerworld.com.

Or fax it to 1-650-524-7604.



TECHNOLOGYEXEC TECH

Accessorize Ergonomically

BY DAVID ESSEX

O SET UP your computer for maximum health, comfort and convenience, you need to look beyond special keyboards and mice to the seemingly mundane things that surround them. Proper placement of the right type of ergonomic chair, desk, copy holder or mouse pad can be more important in avoiding pain, fatigue and injury. So say several ergonomics consultants who helped me identify four categories of

products that would best improve my small home office (see reviews).

I came away from the experience with a heightened awareness of the unnecessary stretches, strains and repeated poundings my body sustains every workday.

I hadn't thought much about

the ergonomics of my workstation until I started changing it.

so I'm shy about making snap judgments about product choices, and the decision depends quite a bit on your personal situation.

But my three consultants two of whom sell products they rec-

ommend and the other who's a respected university researcher - all steered me toward the kinds of products that help you sit comfortably and well-supported, at the right level for your monitor and keyboard.

That said, keep in mind that my selection of products doesn't represent the entire

After the consultants suggested that I stay away from footrests, "gel" mouse pads and glare filters, and knowing that articulating monitor arms are unnecessary if you can properly position your screen without them, I settled

> on a keyboard platform, chair, document holder and back-support cushion.

Essex is a freelance writer in Antrim, N.H.

Desktop InSight

Kensington Technology Group www.kensington.com \$9.99

Consultant Gary Karp at San Rafael, **Calif.-based Onsight Technology Education Services rates document** holders high on his must-have list. Document holders minimize head movement as your eyes dart from screen to paper. Laying pages flat causes you to bend forward too much and strain your neck.

Having difficulty rounding up Karp's favorite, the VuRyte (and having decided that expensive hydraulic holders aren't right for executives, who don't copy from paper to PC as often as secretaries do), I bought this low-cost alternative from Kensington. It can hold a stack of letter-, A4- and legal-size papers and can handle magazines. It doubles as a clipboard, and you can turn it sideway to view wider documents in landscape mode.

The Desktop InSight's extremely lightweight, cheap plastic construction and narrow notch make it unsuitable for books and thick, heavy documents, but it does what it promises for a

decent price.

Banana-Board

WorkRite Ergonomic Accessories Inc. www.wrea.com \$165 to \$180

If your work surface doesn't provide the right keyboard level, you can try an adjustable platform like this device, named for the banana shape it has when its curved mouse platform is fully extended.

The thin but sturdy Banana-Board must be bolted underneath the work surface, so it may require professional installation. It slides easily forward and back and side to side, and a large rubber knob lets you adjust the height.

Intuitive adjustability is a critical feature in many of these accessories, and Banana-Board has it in spades. But I don't like the way the board forces the mouse closer to my body than I'm used to, and it bounces more than I'd like.

Nevertheless, Banana-Board is one of the most flexible and inexpensive ways to get your keyboard down to its proper height.

Obusforme Highback

Obusforme Ltd. www.obusforme.com

Slouching or sitting too straight can strain your back, so anything that encourages you to adopt the right posture is a good thing. If you're not ready for a pricey ergonomic chair, an affordable back support is a good place to start. Think of it as an ergonomic chair insert.

I tried out the Obusforme Highback, which looks like the curvy back of a car's bucket seat. Although it's soft, it keeps the spine firmly in proper position. Cloth straps with plastic snaps let you secure it to any chair. I put the Obusforme in a highbacked wooden chair with arms. I suffer from upper-back pain, so I required the additional neck and upper-back support of the Highback version.

However, I quickly put the Velcro-attachable lumbar cushion aside after it pushed me into a contorted position and shifted me too far forward in the seat pan - a hazard of such devices that Karp had warned me about.



Herman Miller Inc. www.hermanmiller.com

When you sit, it should be in an adjustable chair with lumbar (lower-back) support that you've tried out in your work environment and that's the right height and width for your body. "Seat height and desk height are extremely critical and about the most important part of the equation," says Eileen Vollowitz, a physical therapist who sells ergonomic chairs in Berkeley, Calif. My experience confirms this: Each vertical movement of my keyboard platform and chair threw my neck, arms, legs and back into a new and occasionally painful configuration.

Lacking time to try out multiple chairs, I went for one of the most adjustable sitting devices: Herman Miller's Aeron. My loaded model has six adjustments and a clever lumbar pad that slides up and down notches in the back, pressing in from the outside of the dark, see-through mesh that forms the seat back.

Karp faults the Aeron for not letting you adjust the angle of the seat back, though Herman Miller says the chair automatically adjusts for this when you sit in it. I found the Aeron easy to adjust to the proper height and angle for my new workstation, and I've gotten spoiled by the comfort of its mesh "seat pan" and back. I'm no expert, but I'm pretty sure the Aeron has improved the ergonomics of my office more than any other product.



THE RESIDENCE OF THE PROPERTY OF THE PROPERTY

THE MAGIC BOX KNOWS WHAT'S COMING





CURVEBALL? NASTY SLIPER? SPITBALL IN THE FORM OF A NETWORK CRASH? YOU'LL KNOW. IBM NETFINITY® SERVERS ARE EQUIPPED WITH IBM PREDICTIVE

FAILURE MANAGEMENT, THE MAGIC OF IDENTIFYING PROBLEMS BEFORE THEY BEGIN. THE RESULT?

MAXIMUM UPTIME SO YOUR E-BUSINESS RUNS

SIZE THLY. LEARN ALOUT THE MAGIC BOX

(IN 100 MG THE ETFINITY 5500 M 10 STARTING

A DOTAL COMPANY.

intel inside pentium • ///

xeon...

The major box is an IBM (E business server.

IBM makes a full rainge of Netfinity servers, with models starting at \$1,459. The Netfinity 5500 M20 can be configured with up to four Intel[®] Pentium[®] III Xeon processors and up to 460 ECC SDRAM memory. Price of Netfinity 5500 M20 model 8662319 with open bay is based on estimated receiler price as of a 1/14 and does not include hard bisk prive or other options. Actual receiler price may viry [BM. In the long and Netfinity or Indomnaries or registered trademarks of international Blushos. Macrimes Corporation, Infall the Intel[®] Indomnary product and service names may be indemarks or service marks of others. C1999 IBM Corp. All for

Domain Naming

BY JACQUELINE EMIGH

a (domain) name? The answer might be either more or less than you would expect. The process of obtaining a domain name is actually quite easy, even for a person with little or no information technology expertise. All it really takes is the ability to fill out a Web-based form.

It's becoming increasingly tougher, though, for organizations to nail down the exact domain names they want, especially if they're seeking the toplevel .com domain. Obstacles range from cyberpirates who register names with the aim of selling them to the need for making sure that other organizations don't hold legally conflicting trademark rights.

The supply of domain names is dwindling rapidly, thanks in large part to skyrocketing demand. When domain name services first arose, the number of names in the top-level domains (like .com and .net) seemed more than adequate. But that's changing today because Web sites are so ubiquitous.

"There are about 250 toplevel domain names altogether, yet all but a handful of these are country-specific, such as .uk for United Kingdom and .ca for Canada," says Keith Brown, a lawyer in the Technology and Internet Law Practice at Sugarman, Rogers, Barshak & Cohen P.C. in Boston.

Names in the top-level .com domain are particularly sought after. "A lot of folks think that if you just put .com after your name, people will think you're modern and hip," says Thomas Hopcroft, president of the Massachusetts Electronic Commerce Association (Mass eComm) in Boston.

After discovering a few years ago that meca.com was taken. Hopcroft settled for meca.net for the association. The organization still holds title to the meca.net name but started using it strictly as a place marker and link after deciding to change its acronym MECA to Mass eComm, the association. The group now uses massecomm.org and ebuzz.org.

Waltham, Mass.-based Sitara Networks Inc., a network security software firm, ran across a similar problem. When Sitara CEO Malik Khan found out that sitara.com was in use by a Pakistani travel firm, he opted instead for sitara.net.

Until earlier this year, the only way to register a .com, .net or .org domain name was through Network Solutions Inc. (NSI), a company that lucked into the naming business in 1993 through a cooperative research and development agreement with the U.S. government. "The original contract was very broadly written. It wasn't clear what NSI could or couldn't do," Brown says.

You can still register a domain name through NSI simply by filling out a form on the networksolutions.com Web site. The fee is \$70 for two years. Visitors can also search there free of charge to find out whether a desired domain name is available.

Recently, though, the U.S. Department of Commerce has opened up the domain naming | be known as "name brokers" or process to a new, nonprofit organization. Headed by IT industry luminary Esther Dyson, the Marina del Rey, Calif.based group is known as the Internet Corporation for Assigned Names and Numbers (ICANN). During a two-month test period, five more organizations will become domain name registrars.

Aggravating the supply problem is the growing practice of obtaining myriad domain names. Brown divides practitioners of this cyberart into two main groups: cybersquatters and cyberpirates. "Cybersquatters are people who simply register lots of names. They are potentially innocent. Cyberpirates, though, buy up domain names with the intention of selling the names. To them, it's 'either make me an offer, or I keep the name," " says Brown, who is also webmaster for his firm's informational Web site (netligitation.com). But those who buy domain names with

"cyberbrokers."

But motives for registering multiple names aren't necessarily sinister. Many organizations now see the practice as a protective strategy. MoveCentral Inc., a start-up that bills itself as a "one-stop shop for moving Americans," registered more than 60 domain names before selecting MoveCentral as its company name and domain name movecentral.com for its home page. "We wanted to eliminate the possibility of copycat sites," maintains Peter Lamson, MoveCentral's director of Internet strategy.

Another problem is that domain names have often been at odds with registered service marks and trademarks.

In a major case in 1996, Digital Equipment Corp. bought the AltaVista trademark -- but not the altavista.com domain name - from a software company that was then called Alta-Vista Technology Inc. ATI, though, was given nonexclusales in mind typically prefer to sive rights to use the trade-

AT A GLANCE

In the Works

Possible new top-level domain names include the following:

.store For merchants

.web For sites emphasizing Web activities

.arts For arts and culture sites

.rec For recreation/entertainment sources

.per and .nom For personal sites

.info For information services

.sex For pornographic sites

mark "in a limited manner." For some time, Digital used the domain name www.digital. altavista.com for its AltaVista search engine.

Digital then brought ATI to court for trademark infringement, alleging, among other things, that ATI had "altered the appearance of its Web site's link to Digital's AltaVista Internet search service" by adding graphics similar to those on the search engine site.

Last year, following Digital's acquisition by Compaq Computer Corp., the two parties reached an out-of-court financial settlement that transferred all rights for the AltaVista trademark and domain name from ATI to Compaq.

ICANN is now addressing several problems, including the need for better dispute resolution methods and the dwindling supply of top-level

Recently, the group adopted a dispute resolution policy meant as a compromise between proposals from the new domain name registrars and the World Intellectual Property Organization. A few possible new top-level domain names include .rec, .store for merchants and web for Web emphasis — as well as .sex for pornographic sites.

Emigh is a freelance writer in Boston.

For more information on domain names,

www.computerworld.com/more

Are there technologies or issues you would like to learn about in Quick-Study? Please send your ideas to quickstudy@computerworld.com.

DEFINITION:

Domain names are Internet addresses obtained by people who are opening Web sites. The domain naming system was developed to translate between the numeric IP addresses traditionally used by computers and name identifiers, typically more friendly to human eyes and ears. A Web site address combines the domain name with the language that should be used by computers to fetch a page or file, using the Web protocol HTTP or the file transfer protocol.





RAS EARNED ITS PINSTRIPES.

AMERICA'S PASTIME IS AN e-BUSINESS. TO ATTRACT FANS, THE CAROLINA MUDCATS ARE USING THE WEB. "IBM IS A BIG PART OF THE TEAM. THE 'CATS LOOKED TO IBM AND IBM'S BUSINESS PARTNER TO DESIGN AND SUPPORT THEIR ONLINE OPERATION. THREE IBM NETFINITY® SERVERS RUNNING WINDOWS NT® (NICKNAMED FASTBALL, SLIDER AND CURVEBALL) ARE BEHIND THE MUDCATS' OPERATION, WHICH IS THE ENVY OF AA BASEBALL AND MANY MAJOR LEAGUE CLUBS. VISIT THE MUDCATS AT WWW. gomudcats. com LEARN ABOUT THE MAGIC BOX (INCLUDING THE NETFINITY 5600, STARTING AT \$3,809) AT WWW.



The magic by is an IBM borness server.

18M makes a full range of Netfinity servers, models starting at \$1,459. The Netfinity 5600 can be configured with up to two Intel Pentium (if processors and up to 46B ECC SDRAM memory.

If with open bay is based on estimated reseller price as of 3/199 and does not include other options. Actual reseller price up year, IBM, the e-business logo and Netfinity are trademark of Microsoft Corporation. Intel, the intelligide and Pentium are regulared trademarks of intelliging reserved.

If you have the processors and up to 46B ECC SDRAM memory.

If you have the processors and up to 46B ECC SDRAM memory.

If you have the processors and up to 46B ECC SDRAM memory.

If you have the processors and up to 46B ECC SDRAM memory.

If you have the processors and up to 46B ECC SDRAM memory.

If you have the processors and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

If you have the processor and up to 46B ECC SDRAM memory.

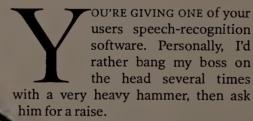
If you have the processor and up to 46B ECC SDRAM memory.

If you have the proces

SPECH

PC speech-recognition systems have come a long long way, but they still have a long way to go By Cynthia Morgan

REGISTA



But let's say your user has an exceptionally good reason for needing speech-recognition capabilities—he's the world's worst typist, he's got severe carpal tunnel syndrome or he needs hands-free computing—and you must support him.

What do you do?

That's the problem I recently set out to solve at *Computerworld*. One of our editors, a top candidate for the Frequent Typist's Club, developed a bad case of carpal tunnel syndrome; doctors warned her off the keyboard. Speech-recognition software seemed to be the solution.

Was it? The short answer is "no." Speech-recognition software has made impressive gains in the past year, and I would probably recommend it for straight text dictation. But hardware deficiencies and the extreme complexity of the typical Windows desktop make it an exercise in "pain recognition" as far as meat-and-potatoes editing and navigation are concerned.

Users have this nasty habit of wanting software to work properly but to stay out of the way when not needed.

Our editor was no exception, and I knew she wouldn't have much patience with anything that wasn't pretty accurate right out of the box. So I began testing speech-recognition software and peripherals, checking products from the biggies: Lernout & Hauspie Speech Products NV in Burlington, Mass., Dragon Systems Inc. in Newton, Mass., IBM and Philips Electronics NV in Vienna. I was looking for the dream product that recognized everything, was easy to use and unobtrusive when not in use.

I didn't find it. I did find that speech-recognition software was much easier to use and had incredibly better recognition capabilities than it had last year. Straight out of the box, virtually any speech-recognition system I tried got dictation right about 90% of the time without being trained to recognize my

CIOSE, BUISSING STILL

TECHNOLOGYFIELD REPORT

Speech-Recognition Product Vendors

Andrea Electronics Corp. Melville, N.Y. (800) 707-5779 www.andreaelectronics.com Headsets: ProVoice Solutions ANC-700 (\$79.95) and Anti-Noise 60/61 (\$34.95)

Dragon Systems Inc. Newton, Mass. (800) 825-5897 www.dragonsystems.com Software: NaturallySpeaking Preferred (\$160) Hardware: NaturallySpeaking Mobile (portable, \$299)

Armonk, N.Y. (888) 411-1WEB www.software.ibm.com/speech Software: ViaVoice Millennium

Professional (\$179) and several other editions

Lernout & Hauspie Speech **Products NV** Burlington, Mass. (800) 380-1234 www.lhs.com

Software: Voice Xpress (\$149)

Labtec Inc.

Vancouver, Wash. (360) 896-2000 www.labtec.com Headsets: ClearVoice headset/mike LVA-8550 (\$35)

Philips Electronics NV

www.speech.be.philips.com/ ud/get/Pages/h0721us.htm Mobile SR: Philips FreeSpeech 2000 (\$149.95)

speech patterns. That last 10% is the | application to be used with the new deal-breaker, though.

Teaching your speech-recognition system to become acceptably accurate is a frustrating business that involves spending at least an hour of "training" - reading canned paragraphs back to the computer while it records your speech patterns. Then you'll spend another few hours in "retraining" - correcting the system's mistakes and possibly repronouncing the words to get them right. While the engine is learning how you speak, you'll be busy learning how it listens. There are no standard commands for getting speech engines to work properly; commands for different tasks differ greatly.

Speech-recognition software isn't something you want to use if you're unfamiliar with an application. So make sure your user is up to speed on every | All the systems I tested could pro-

Many of these systems can actually shortcut complex application procedures with one- or two-word commands. For example, instead of saying "type URL www.computerworld.com and press the enter key," I might just say "jump to Computerworld," and the system would understand.

Hot Dictation. Cold Commands

When you've finished with the training, any one of the systems will probably give reasonable results at dictation (typing text and numbers). All systems offer at least some integration with the most popular productivity applications, such as Microsoft Corp.'s Office, and let you perform application-specific operations.

duce at least 93% accuracy at straight dictation with enough training; Dragon's NaturallySpeaking rose to the 98% level for text accuracy after roughly five hours of training.

Controlling the computer's navigation and formatting, however, was a different matter. None of the programs I tried could get through the edit-andformat cycle of highly formatted documents without a great deal of what I came to call pain recognition. When I started my tests, I established a tough set of memos, documents, spreadsheets and Web clicking sequences, intending to grade each speech-recognition system on how well it duplicated the originals. Even my top choice, Naturally-Speaking, failed to successfully finish the first test, a professional-looking résumé with bullets, indents and multiple sizes of text.

In each case, the program had trouble distinguishing between commands and dictated text. My favorite phrase (after a couple of unprintable phrases the system ironically had no trouble at all recognizing) became "undo that." And none of the systems I tried was much good at surfing the Internet unless I'd bookmarked favorite sites.

IBM's new ViaVoice Millennium Pro is much better than its predecessors although it still gave me a few good bloopers, like the time I said "correct discrete" and it thought I meant "create task to screech." That was prophetic: By the time I'd finished that task, I was ready to screech. I had the most success in having my edit-and-format commands understood using ViaVoice, however.

I had high hopes for Lernout & Hauspie's Voice Xpress because it had the most extensive (and exhausting) initial training sequence. Sadly, it also had the most trouble with both dictation and formatting.

The Bottom Line

After spending months with the best PC speech-recognition systems on the market, I'm writing this article using an old-fashioned keyboard and mouse. While some, notably Dragon's, do a remarkable job of voice-enabled typing, I can still do a faster, better job using my

Fortunately, few software categories are evolving as fast as speech recognition. There's a lot of incentive; the industry at large considers it an imperative for bringing computer holdouts on board, and IT departments see it as a way to ease the introduction of automation in areas that must be kept handsfree. Speech-recognition technology has come as far in the past year as it had in the previous decade, and the pace seems to be accelerating.

Faced with the daunting prospect of spending hours teaching a finicky

How Do You Support Speech Recognition?

Degree of difficulty (1 - 10): 6

Not as tough as dragging a Macintosh user to Windows, but technology problems make it tougher than expected.

Technology's getting better: Prices are coming down, and quality is going up.

Fair application support: You will find support for the full Microsoft Office suite, Netscape Communication Corp.'s Navigator and other popular programs right in the box. Most packages let you add support for other programs as needed.

WORKING AGAINST YOU:

User psychology: Vendor claims that the systems work well out of the box are mostly hype. Unless the user has a big investment in it, the problems of speech recognition probably outweigh the advantages.

Heavy resource requirements: Fast processors, top-quality sound cards and highend microphones make a big difference.

Desktop-bound: Notebooks, especially older models, may have trouble.

Windows-centric: If your user needs non-Windows software, think twice.

RESOURCES:

Hardware: Commandeer the fastest Pentium II possible; most applications take advantage of it. Get lots of memory and a top microphone.

Software: Speech software should be the last thing to go on the system, after all applications, upgrades and service packs have been installed and vetted.

Support hours: Ten hours for setup, installation and testing, plus user training.

User hours: At least four. Your user will need an hour of system training, another hour or so to become comfortable with commands and two or more hours (spread over about a month) to correct vocabulary errors.

Other requirements: You may need some of the user's documents during training; some systems can be trained to add vocabulary in later sessions. - Cynthia Morgan

speech-recognition application to speak her language, my user has put speech recognition on hold. We'll hope that the better microphones that are scheduled to come out late this year, and some office rearranging, will ma this "enabling technology" less disabling for her.

But for now, Dragon's Naturally-Speaking and its brethren will probably prove easiest to support if you have a motivated user, particularly if he leans toward lengthy documents. If dictation takes second place to on-screen navigation, check out IBM's ViaVoice package. And remember: Train, train, train.

Your fridge has e-mail

And your microwave and the local gas pump have IP addresses and Web browsers. Why? To push corporate applications out to customers wherever and whenever they want to do business. To make this happen, IT managers will have to develop new types of applications – and make sure they're bulletproof By Emily Kay

WOMAN CRUISING DOWN the highway sees the gas gauge on empty and at the same time realizes she's hungry for a Whopper and fries.

No problem. She zips over to the service station, touches the Burger King ad on the electronic pump screen and drives through to pick up her order after filling the car with gas.

That evening, musing that she'd like a new chicken recipe, she taps on the microwave door and — voila! — up pop cybertips for cooking a Perdue roaster.

Uh-oh, there's only a spoonful of Cherry Garcia in the freezer. Before tossing the empty container, she scans the bar code of the Ben & Jerry's container by her freezer door, which adds it to the shopping list being compiled by her Web grocery service.

It's Out There

Some of these scenarios that seem to come out of *The Jetsons* are happening now, and it may mean big changes for information technology managers when other consumer-oriented Internet appliances explode into widespread use. Gas pumps, refrigerators and microwave ovens can, in theory, be linked to the Internet today. Gurus expect that similar everyday gadgets will eventually become commonplace Internet-enabled devices, just as handheld computing devices are today.

To help their companies compete in this new world, IT managers will have to build and support "customer-facing" applications, some of which will run on the Palm Computing operating system; others will rely on Microsoft Corp.'s Windows CE or Sun Microsystems Inc.'s Jini software or Java platform.

Some of these devices will truly be thin clients, with only minimal processing power, memory or hard-disk space. These "everywhere, anytime" applications will demand continuous uptime from corporate servers and further tax already crowded networks.

Some in the industry say that Webenabled renditions of everyday products may even displace the mother of all renegade contraptions — the desktop PC — for some applications.

Coming to a Kitchen Near You

Internet appliances are Web-enabled digital tools that can do a few discrete tasks more easily, cheaply and efficiently than PCs can. Seattle-based CMi Worldwide Inc.'s Advantage 2000 "kitchen resource center," for example, is a kitchen-proof interactive TV/PC/CD player built on Hitachi Ltd.'s SH3 chip, Spyglass Inc.'s Device Mosaic browser technology and VxWorks, a non-Windows operating system from Wind River Systems Inc.

The \$200 countertop and \$1,500

built-in units encourage cooks to download recipes from the Web, spam friends with their favorite menus or watch Julia Child dish up her specialties on TV.

International Data Corp. (IDC) in Framingham, Mass., forecasts that the U.S. market for non-PC consumer Internet appliances — including Net TVs, Web phones, gaming devices and smart handheld devices — will grow from the 3 million shipped last year to almost 28 million by 2002. By 2001, IDC predicts, Internet appliance shipments will exceed those of desktop consumer PCs.

Of course, computer hardware and software makers don't plan to be left behind. Intel Corp. is designing new chips for low-power appliances, and Microsoft is developing software for set-top TV boxes and automobile navigation systems. Sun's Jini software could well become the common language for those new devices, while the company positions JavaOS for consumers as the operating system for devices such as set-top boxes, interactive TVs, Web phones and automobile navigation systems.

Simple Is Good

"Consumers like the concept of dedicated and multiple-use appliances because of their simplicity," says Jeff Hulton, senior vice president of business development at Cambridge,

Anything's Possible

From the Dick Tracy files:

- Dallas-based ICL, a global information technology services provider, and Frigidaire Home Products, the North American arm of Sweden's AB Electrolux, have demonstrated a model smart refrigerator with an integrated 233-MHz microprocessor. 32M bytes of RAM, an Ethernet link, a bar-code scanner, Windows 95 and a flat-panel touch screen. The product could be in homes by the end of next year, says Clay Calhoun, North American director of interactive retailing at ICL's retail systems division.
- While ordering food from a system like that may seem far out, \$83.7 billion BP Amoco PLC doesn't dismiss the possibility that its recently announced smart gas dispensers could support such an application. Atlanta-based Radiant Systems Inc., an integrated retail technology supplier, developed the technology, which is based on Windows CE and Internet standards such as TCP/IP, Extensible Markup Language and Simple Mail Transfer Protocol. Its purpose is to enable a system to alert support personnel automatically via e-mail of equipment failure and suggest preventive maintenance action. Emily Kay

TECHNOLOGY

Mass.-based HighPoint Systems Inc. HighPoint integrates bar-code scanners and database technology for home grocery shopping applications. "People don't like the PC for this type of [business-to-consumer e-commerce] transaction," he says.

For example, Hulton says, online grocers enroll consumers quickly but lose more than half in the first 90 days because PCs take too long and are too complicated to use for direct ordering. Compare nine minutes on an Internet appliance to an average online PC session of more than 47 minutes, and there's no contest, he says.

It Ain't Easy

It's clear that handheld computing devices are the most prevalent Internet appliances to make it into the enterprise to date, with millions of units sold and millions more to be sold this year and next. Smart cellular phones aren't far behind, and other Internet appliances are on the way. But linking together such disparate device types with their limited memory capacities and computing power presents a variety of challenges.

For one thing, device formats are all over the map, from Palm devices and Microsoft CE handheld personal digital assistants (PDA), smart phones, pagers and set-top boxes to household appliances and consumer electronics. Different devices use different protocols and operating systems, and the smallest household appliance microprocessor with infinitesimal memory and power will be joined to strapping desktop workstations.

In addition, network traffic bottlenecks and bandwidth questions —
always problems for network managers
— will increase dramatically when anywhere from a few to thousands of these
contraptions are linked together. "The
challenge is how to accommodate
PDAs, Web phones, Web pads and settop boxes in compelling ways for the
consumer and in an open architecture,"
Hulton says.

When Outsourcing Is the Answer

Limited network bandwidth presents a formidable challenge to retailers now, and broadband cable modems will soon deliver fast Internet connectivity to more homes. That change will increase expectations for merchants' IT departments to provide around-theclock uptime for hundreds or thousands more users seeking access to their sites.

The retail systems division of ICL, a Dallas-based global information technology services provider owned by Fujitsu Ltd., has already seen some problems with software and network crashes at eBay Inc., ETrade Group Inc. and



Charles Schwab & Co., says Clay Calhoun, North American director of interactive retailing.

One answer is to hire external experts to figure it all out. ICL reports a 40% increase in U.S. business over the past year from companies seeking to deploy, support and maintain new Internet appliances, Calhoun says.

When Scotty's Home Market expanded its online grocery-ordering capabilities recently to enable bar-code scanning, the Lake Zurich, Ill.-based retailer outsourced the complexities of the technology to HighPoint Systems, which integrates software clients and Web functionality with its proprietary HPX Server transaction server for Windows NT or Unix.

The server seamlessly integrates Internet appliances with PCs as well as any back-end data source, including standard relational databases, enterprise resource planning systems and data warehouses, Hulton says. The system cost Scotty's \$270,000, which includes integration services.

Scotty's application lets a consumer point an SPT 1500 handheld unit from Holtsville, N.Y.-based Symbol Technologies Inc. at the universal product code on a product or in a personalized catalog, press a button and send the item to the "Scottyscan" screen. When the list is finished, the user places the Scottyscan in a cradle, which is linked to a PC and synchronized with Scotty's Web site, to transmit the order. Symbol and 3Com Corp. developed the SPT 1500, which combines bar-code scanning technology with Palm Computing standard applications.

"As you finish a carton of orange juice, you can scan the bar code as you throw it away," says Scott DeGraeve, president of Scotty's Home Market. "As you consume things, the Scottyscan unit is doing continual replenishment."

you@fridge.com

Granted, tapping on a handheld computer to replenish groceries isn't exactly using a refrigerator to stock itself. But that's not so far-fetched, some visionaries claim.

It's very likely that people will use such appliances to do their grocery shopping, watch TV, surf the Web, send and retrieve e-mail and bank online as well as set up calendars and videocon-

ferencing, says Calhoun. "All those capabilities can be done in the door of a refrigerator."

Calhoun says he believes retailers could end up giving away intelligent refrigerators to top-tier customers in return for recurring Internet account and delivery service fees.

Customers want to determine "when, how and where to shop," whether it's scanning orders from the kitchen or placing orders from office PCs or cellular telephone screens in the field, according to Hulton. ICL developed a program for British Airways PLC that lets employees order groceries from their office PCs, and Calhoun says he believes refrigerators will soon have the same capabilities.

It's clear that IT leaders need to prepare now for the future of Internet appliances in the workplace.

After all, you don't want to be the last to post your online mortgage application on refrigerator doors all over America.

Kay writes about technology as a principal at Choice Communications, an editorial consulting firm in Chelmsford, Mass.

TECHNOLOGYFLASHBACK

50 YEARS OF TECHNOLOGY INNOVATION • 1950-1999

Technology Happenings

- Apple Computer Inc. registers for a domain name.
- IBM introduces its PS/2 machine (below). It includes a 3-in. floppy disk drive



and video graphics array, which become standard in IBM PCs.

■ Apple engineer William Atkinson designs Hy-

percard, a software tool that simplifies development of in-house applications. Apple distributes the program free with Macintosh computers until 1992.

- Apple releases the Macintosh II and Macintosh SE.
- David Duffield and Ken Morris form **PeopleSoft Inc.**
- Stewart Brand publishes *The Media* Lab: Inventing the Future at MIT.
- Andrew Tanenbaum releases Minix, a Unix clone system. Later, Linus Torvalds extends this work and creates Linux.
- Motorola Inc. unveils the 68030 microprocessor.
- IBM and Microsoft Corp. announce **OS/21.0**. It doesn't feature a graphical user interface.
- Microsoft announces **Windows 2.0** and introduces Excel for Windows 2.0.
- UUnet Technologies Inc. is founded to provide commercial access to Unix to Unix Copy Program and Usenet.
- The Christmas Virus, a Christmas tree graphic that reproduces and mails itself, infects IBM's in-house e-mail network, significantly slowing it down.
- Borland International Inc. ships the Quattro spreadsheet program, including emulation of Lotus 1-2-3 commands. This results in a legal battle with Lotus Development Corp.

Other Notables

Toni Morrison's *Beloved* wins the Pulitzer Prize for Fiction.

1987 Best Picture: The Last Emperor

1987 Album of the Year: U2, "The Joshua Tree"

1987 Rock Vocal Performance: Bruce Springsteen, "Tunnel of Love"

1987 Emmy for Best Comedy: The Golden Girls, Best Drama: LA Law

■ Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

The Computer: Black Monday's Scapegoat

BY LAURA HUNT

N MONDAY, Oct. 19, 1987, the Dow Jones industrial dived more than 500 points, and the New York Exchange (NYSE) experienced a record volume of 604.33 million shares, following a record Friday volume of 330 million shares. The Dow plunged 22.6% to 1,738.74, which was far greater than the 12.8% decline on the original Black Monday, Oct. 28, 1929.

Experts were mystified be-

cause no major financial news or announcements seemed to set off the increased selling. President Ronald Reagan told the press, "I think everyone here is a little puzzled because... all the business indices are up. There is nothing wrong with the economy."

Treasury Secretary James Baker suggested that a Democratic bill to increase taxes, which had just passed House and Senate committees, helped bring about the disaster. Other possible explanations included fears of conflict in Iran, the U.S. trade deficit, the federal budget deficit and fears of inflation and a weakening dollar.

But the favorite scapegoat was programmed trading. The ability to automatically trade large blocks of stocks or index futures allowed a massive amount of transactions to be fed to the trading system. The

increased availability of up-tothe-minute market data and the increased processing speed available with computers allowed traders to

trade large amounts of stocks and futures at target prices within just minutes.

On Oct. 16, the trading system was halted briefly because of capacity problems caused by program traders handling \$80 billion in pension funds. The shutdown increased the sense of panic brought on by the Dow's reaction to the increased trading and brought on another wave of selling that backlogged the system. The systems that processed and printed the orders on cards became clogged, further panicking traders.

Earlier in the month, Securities and Exchange Commission President David Ruder gave a speech in which he addressed the volatility of the market. He said programmed trading had made the stock market too complicated to regulate. He said he worried that traders would be able to manipulate the market with sophisticated buy/sell schemes. After the crash, this worry intensified.

Programmed trading was

suspended for the week, and a presidential commission was convened. In January 1988, the panel's findings caused the NYSE to impose restrictions on day trading for at least one week on any day the Dow moved more than 75 points.

Pressure to fix the problem was placed on the Securities Industry Automation Corp.

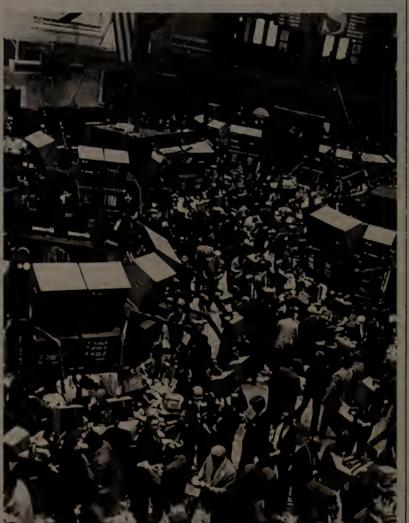
(SIAC), which operates computer systems for the NYSE. The SIAC upgraded processors, memory, disk capacity and switches and

changed control and processing software to handle increased capacity. The number of listed stocks available for computerized trading was also increased, decreasing the dependency on printed cards.

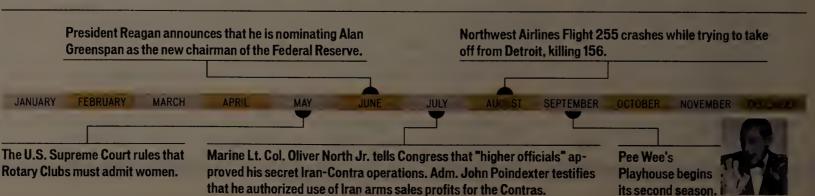
Ironically, the SIAC knew changes were needed and how to make them. On Black Monday, the American Stock Exchange Inc. (AmEx) went live with its new double-capacity market data system. The system, also supplied and maintained by the SIAC, helped the exchange largely escape the damage sustained by the Dow and other markets. With the experience gained from successful implementation of the AmEx system, the SIAC could quickly upgrade the NYSE.

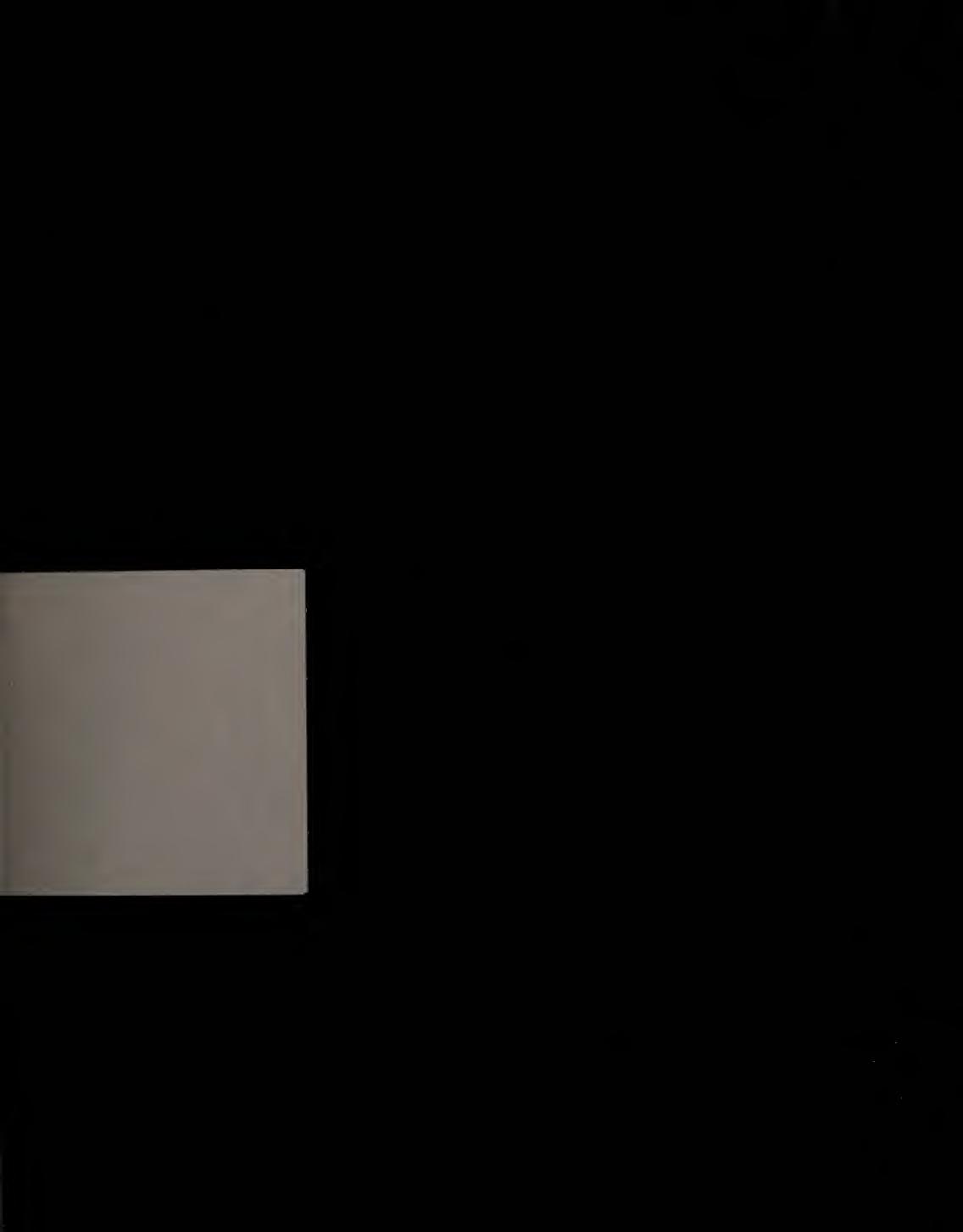
In July 1988, Charles Mc-Quade, president of the SIAC, told *Computerworld*, "If a 600 million-share day occurred now, it could be handled with style and grace."

Hunt is Computerworld's corporate librarian.



WHEN PANIC SET OFF a selling spree at the New York Stock Exchange, some blamed new technology that enabled large trades of stocks quickly







TECHNOLOGYSKILLS SCOPE

The Future of PowerBuilder

The work and salaries are steady, but some **PowerBuilder pros** are powering up in Java, C++ and Web development in case the tool loses ground to other applications By Steve Alexander

OWERBUILDER developers are facing a tough career decision these days: Should they stick with the rapid development tool or move on to new technologies?

Demand for the product from Emeryville, Calif.-based Sybase Inc. has faltered because of interest in Java and other Web technologies. PowerBuilder 7.0 has revived interest in the product in its support of Web-based applications, but future demand for PowerBuilder staffers is unclear.

Richard Gallagher, CEO of Xytech Systems Corp., a Burbank, Calif., maker of workflow management software, says fewer college students are studying PowerBuilder and the ranks of existing developers have thinned. As a result, it is becoming more difficult to hire PowerBuilder professionals.

Some say PowerBuilder is also losing ground to client/ server competitors such as Microsoft Corp.'s Visual Basic. Don Stroud, director of MIS at The Plain Dealer Publishing Co., publisher of The Plain Dealer daily newspaper in Cleveland, says he is phasing out PowerBuilder and rewriting applications in Visual Basic because it has become the stronger tool.

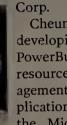
A one-week PowerBuilder training course through a valued-added reseller costs \$2,000 to \$4,000. Information technology staffers PowerBuilder experience can earn \$30,000 to \$100,000, although most salaries range from \$45,000 to \$55,000. Contractors can earn up to \$85 per hour. Heavy PowerBuilder users include government agencies and the auto, insurance, financial and telephone industries.

Here are four viewpoints on the PowerBuilder market and its future from IT profession-

BENNY CHEUNG

Partner One Point Solutions Inc. Detroit

Benny Cheung learned Power-Builder at Electronic Data Systems Corp. in the early 1990s, when the firm was creating a client/server human resources system for General Motors



Cheung is developing a PowerBuilder resource management application for the Michigan

Department of Corrections that will help determine which prisoners should be assigned various correctional facilities statewide.

PowerBuilder is easier to learn than C++ or Java "because a lot of things already are done for you in the PowerBuilder world. There is a lot less coding involved," Cheung says.

Cheung says he believes PowerBuilder 7.0 has revived interest in the product through its support of Web-based applications, but he has doubts about the product's future.

"PowerBuilder has enough of an installed base that there always will be a need," he says. "But whether there will continue to be high demand is yet to be seen." As a result, he says he will probably "move into Java and Web development, which are hotter."

KEVIN L. BROWN

PowerBuilder consultant Klub Services Inc.

Kevin L. Brown learned PowerBuilder while developing a commercial loan-tracking application for Boston banking firm Fleet Financial Group Inc. in 1994. The bank offered only a one-week training course; he learned the rest on his own.

"I had never done a lot of heavy-duty programming until I learned PowerBuilder,

although I'd taken classes in Basic and Cobol," Brown says. PowerBuilder developers should be well acquainted with databases like SQL and Oracle, Brown says, but there's no need to know languages such as C++ or HTML for Internet programming. His favorite Power-Builder resources are the Sybase Web site and the Power-Builder Developers Journal.

For the past year, Brown has been working on an imagetracking system for the Nation-

al Geographic Society Washington. Although he says he anticipates that the large number installed of

PowerBuilder systems will perpetuate a need for developers, he has seen demand taper off in the past two years.

"I don't know if companies will consider developing many new applications in Power-Builder, because Java and Web development have taken the steam out of the PowerBuilder market," Brown says. "It's too early to tell if Version 7.0 will make PowerBuilder a big deal

Brown says he expects to continue working in Power-Builder, but he will hedge that bet by seeking assignments that expose him to technologies such as Java and C++.

KENT COFFEL

Assistant technology architect Maritz Travel Co. St. Louis

Kent Coffel is a PowerBuilder developer who has switched to Web work, but he credits PowerBuilder with helping him get his current job.

"I started Web development using PowerBuilder 5.0. That turned out not to be the best solution, but Power-Builder's object-oriented concepts helped us move forward and find better ways of doing things," Coffel says.

He says PowerBuilder is past its prime but shows no signs of going away. "I would say overall interest in PowerBuilder peaked a couple of years ago. But it is still widely used and respected, and we will continue to use it for the foreseeable future because we have so much invested in mission-critical systems that handle large travel groups."

Coffel's firm uses thirdparty training, "but half the



people in our shop picked it up on their own. It's easier to learn than C or Java." He says people who

want to do PowerBuilder work should understand databases and object-oriented concepts.

GUY GARDNER

Chief research and development scientist

Dynamic Health Care Technologies Inc. Waltham, Mass.

Guy Gardner, an information systems manager and selftaught PowerBuilder programmer, says it is becoming more difficult to find experienced PowerBuilder people. "It's harder to hire people with a minimum of three years of PowerBuilder experience," says Gardner, whose company develops large PowerBuilder workflow applications for hospitals and medical laboratories.

"I don't see the market shrinking, but I don't think it's growing like it was three or four years ago," he says. "However, I still see people moving into the field."

Although Web development has stolen PowerBuilder's thunder, Gardner says he thinks that may not last. "People will find out that the Web is



not the greatest thing for enterprise applications and move back to client/ server tools."

That would

bode well for PowerBuilder, which Gardner says "is head and shoulders above Visual Basic and Visual C," its competitors in enterprise-level Windows applications. No matter what happens, he figures the market is big enough to last five to 10 more years.

Gardner's advice to those entering the field: "The pro is that the work is out there and salaries are up. The con is that the future is not exactly clear. But then I think that anybody who wants to get into programming should not bank his or her entire existence on one technology." >

Alexander is a freelance writer in Edina, Minn.

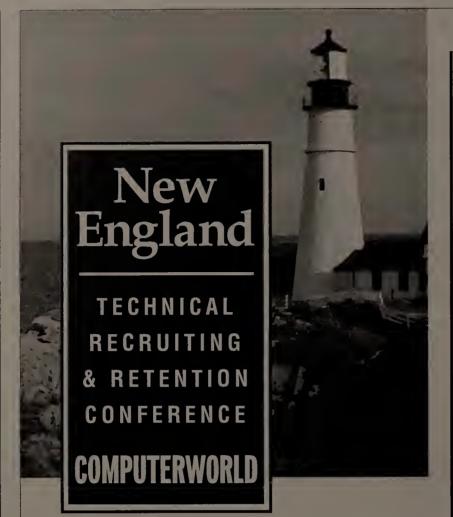
SOFTWARE ENGINEER Software engineer to design develop and test computer proams for business applications analyze software requirements to determine feasibility of design direct software system testing rocedures using expertise in PowerBuilder, Sybase and C++ uirements: Bachelor's Degre equivalent in Compute ience or related field and tw rears experience as a software engineer or computer program mer, knowledge of PowerBuilder Sybase and C++. Salary: \$57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Tom Rusnack, Charleroi Job Center, 10 Paluso Drive, PO Box 210, Charleroi, PA 15022, Job No. 7055478.

Software Engineer II for development of video and audio equipment and processes. Require Master's degree in computer science, physics, math, or electrical engineering; math, or electrical engineering; one year experience in software development in high-tech industries. Experience to include background in broadcast video, digital imaging, telecommunication or computer systems. Knowledge of modern software technologies (object oriented, component technology, internet protocols, and real-time techniques. Salary \$56,455 to \$63,000 per year, 40 hours per week. Refer to job order no: 3060880. Send resumes to Pat Redington, UTAH DEPART-MENT OF WORK FORCE SERVICES, 140 East 300 South, First Floor, Salt Lake City, Utah 84145-0249.

Software Engineer (2 openings): Design, develop and implement computer software systems using PeopleSoft and related software. Work requires extensive travel and frequent relocation. Must have 1 year of experience as Software Engineer or as a computer professional as well as 1 year of experience using PeopleSoft and related software. Bachelors degree in Computer Science/Applications, Engineering, Math, Physics, Chemistry or business related field. Salary is \$85,000.00 per year, 9am - 5 pm. Send resumes, referencing Job Order 2028001, to Mr. Greg Schwing, Mgr., Mon Valley Job Center, 345 Fifth Avenue, Mckeesport, PA 15132.

Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation using graphic user interface hardware/software including: Visual Basic and Windows NT. Work involves extensive travel and frequent relocation. Bachelor's degree or foreign equivalent in one of several limited fields: Computer Sci/Apps. Eng., Chem., Math or Physics. Salary is \$65,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Tom Dembosky, Mgr., Indiana Job Center, 350 N. Fourth St., Indiana, PA 15701: Job Order No.: 5027743.





October 4, 1999 **Boston Marriott Burlington** Burlington, Massachusetts

On October 4, 1999, you have a special opportunity to update your recruiting and retention skills and network with recruiters in your area at the third annual New England Area Technical Recruiting & Retention Conference, held at the Boston Marriott Burlington, Burlington, Massachusetts.

The Burlington Marriott, located just 15 miles from downtown Boston, has the facilities and services you need to make your trip a success whether you are traveling for business or pleasure. If it's a vigorous workout you're looking for or a place to simply relax, the Burlington Marriott has a fully equipped health club includwhirlpool and ing sauna addition to the indoor and outdoor pools. Count on Marriott dependability to make your stay a memorable one.

This conference program is developed exclusively for corporate human resource professionals who recruit directly for their hiring organizations. Vendors of selected, targeted products and services may participate through sponsorships and/or exhibits.

SELECTED SESSIONS INCLUDE:



CUTTING EDGE TOOLS FOR THE Internet Recruiter

Dr. Bret Hollander, President, NETRECRUITER

Recruiting changes every second on the Internet. This practical session from a leading internet recruiting professional will deliver the latest in electronic recruiting tools.



Sourcing Techniques

Cathy Peterson, Director of Candidate Services, Romac International

Do you know where your next hire is going to come from? Do you know how to forecast your hires for the next year? Chances are you don't. You probably have a good idea where your successes come from, but are there other sources that you don't even know about? By adjusting your sourcing techniques, you can increase your odds for more hires and more importantly be able to plan and forecast your hires beyond tomorrow. Get the latest update on various sourcing techniques in this tactical and highly interactive session.



THREE R'S FOR THE NEW MILLENIUM: RETRAINING, RETAINING AND REWARDING Maryfran Johnson, Editor, Computerworld



DEFENDING THE FORT, RETENTION **TECHNIQUES**

Joe Andrews, Vice President of Human Resources, Progress Software

Based on the front-line experiences of an HR executive in a technology company, you'll gain keen insight on some of the winning nonmonetary perks needed to help ensure that your company is the "greener pasture."



HIRE THE BEST: MAKING RECRUITING Your Competitive Edge

Irv Naar, Director of Recruiting, Atlantic Data Services

A principal impediment to corporate growth is a company's ability to source, recruit and hire the key talent that it needs to compete and succeed. Via an actual case study, which examines the concepts of "relationship recruiting," you will see how a corporation successfully transformed its recruiting function from being the number one corporate problem to being one of its principal competitive advantages.

COMPUTERWORLD

CALL THE CONFERENCE HOTLINE AT 1-800-488-9204

Software Engineer (5 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. One year of experience in job offered or as a computer professional as well as one year of experience using 1 of Group A and 3 of Group B OR 2 of A and 2 of B, as follows: Group A - Oracle RDBMS, Designer 2000, Developer 2000, Oracle Applications (Financials, Manufacturing - Order Entry & Inventory); Group B - Oracle Forms, Oracle Reports, SQL-*Plus, Pro**C, PL/SQL, SQL*Forms, SQL*Reports, Work involves extensive travel and frequent relocation. Bachelors degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Salary: \$65,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Washington Job Center Manager, Millcraft Center, Ste. 150 LL, 90 West Chestnut Street, Washington, PA 15301. Reference: Job Order No. 1027772.

Sr. SAP Technical Analyst (Three Openings). Develop & customize software to detect business functionality gaps between the client's specifications & SAP software modules within Logistics (SD/MM/QM) & Financial (FI/SL/CO/PA); create tables, transactions & logical databases; define the requirements of SAP interfaces with external, legacy & third party systems; manage data migration transfer for the purpose of software development for complex new tasks which includes customizing of fully integrated software in SAP/R3/ABAP/4 environment. Must have either Bach deg in Engr., Computer Sci., Math +6 months exp configuring & implementing SAP or 2 yrs work exp + 6 months exp configuring and implementing SAP, 40hrs/wk., \$110,000/yr. Apply at the Dallas Workforce Commission, 1117 Trinity, Rm, 424T, Austin, TX, 78701, J.O. #TX1006747. Ad paid by an Equal Opportunity Employer.

MAINFRAME & CLIENT SERVER OPPORTUNITIES

With IT project teams working across eight time zones, from seven countries on four continents, IMRglobal is always looking for more opportunity.

and client server experience

Programmer/Analysts
Systems Analysts
Technical Consultants
Project Leaders
Project Managers

For consideration, please forward a resume to: IMRglobal, Attn: Recruiting, 100 S. Missouri Avenue, Clearwater, FL 33756; fax (727) 467-8941; e-mail jobs@imrglobal.com See us on the web at: www.IMRglobal.com. EOE.

IMRglobal
the power of vision.
the value of results.
north america • europe
• asia-pacific

SENIOR CONSULTANT - Manage consulting contracts through the design, development & implementation of client/server business systems: meet w/ clients to define requirements; perform functional & technical planning; design total system architecture; lead development & execution including coding, testing, documentation, installation & post-installation support. Utilize knowledge of relational database design, administration & programming. Required: Bachelor's Degree in Computer Science, Information Systems, Engineering, or related degree. Two (2) years experience in job offer or as Associate Consultant. Experience must include working w/ financial & banking systems on Windows NT Advanced server & BackOffice architectures, database design & administration on NT/Sybase SQL server, development on Visual Basic, Access & Excel, and development methodology using Rapid Application Development & object-oriented standards, 5% air travel involved. Salary \$65,000/year. Apply at the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas, 78701, J.O.#TX1006749. Ad Paid by An Equal Opportunity Employer.

Software Engineer (2 openings): Design, develop and implement computer software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience in job offered or as a computer professional as well as one year of experience using: 1 of Group A and 1 of Group B and 1 of Group B and 1 of Group B and 1 of C as follows: Group A - DB2, IBM3090, IBM ES9000, MVS, IMS, IDMS, Group B - CL/400, CICS, TSO, VSAM; Group C - TELON, COBOL/400, Bachetor's degree in one of several limited fields: Computer Sci/Apps, Eng. Chem., Math or Physics. Salary is \$65,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Terry Kinney, Mgr., Armstrong Ccunty Job Center, 1270 N. Water Street, PO Box 759, Kittanning, PA 15370, Reference Job Order No.: 9101747

Programmer Analyst: Plans, develops, tests, and documents computer programs. Converts project specifications, using flow-charts and diagrams, into sequence of detailed instructions and logical steps for coding into computer language. Analyzes, reviews and alters program to increase operating efficiency or adapt to new requirements using various mainframe and midrange hardware/software and databases including HP-UX, HP900C, Novel Netware, HP Workstations and GlancePlus. One year of experience in job offered or as a computer professional required. Work involves extensive travel and frequent relocation. Bachelors degree or equivalent in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math, Physics or scientific related field. Salary: \$50,000 per/yr40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Duane M. Brentzel, Manager, Alle-Kiski Job Center, 3 Kensington Square, New Kensington, PA 15068. Reference: Job Order No. 7055472.

Programmer Analyst: (J.O.N. 948248) Plan, develop, test and document computer programs; evaluate user requests for new evaluate user requests for new rondified programs; clarify program objectives; identifying current procedures using HP UX, Informix On-line, Informix 4GL. Reqs. a bachelors in Comp. Sci., Sys. Analy., CIS, Comp. App., Comp. Engg., Elect'l Engg., Electro. Engg., Electro. and Comm. or Math. plus 1 year exp. in the job offered. \$55,000 p/yr, 40 hrs p/week, M-F, 9a-5p. To apply please mail resume with job order # 948248 and copy of ad attached to AR Employment Security Department, 1626 South 8th Street, Rogers, AR 72203 or AR Employment Security Department, P.O. Box 2981, Little Rock, AR, 72203, Attn: Mr. David Hayes.

PROGRAMMER/ANALYST DATABASE ANALYST

SITAL SERVICES seeking candidates with commercial experience in the

programmer/analysts and application programmers with 2-7 years commercial experience. Candidate should have a BS (or foreign equivalent) in Computer Science or a related field.

database analysts and developers with minimum 3 years commercial experience. Candidate should have an MS (or foreign equivalent) in Computer Science or related field.

Full time permanent positions are available in San Francisco Bay area, and nationwide.

OPERATING SYSTEM - Unix, MS Windows, NT/95, QS/2
RDBMS - Sybase, Oracle, MS GQL Server, Informix
Front-end Tools - Visual Basic, PowerBuilder, Developer 2000, Designer 2000
APPLICATIONS - ERP, Inventory, Purchasing, Distribution
Internet Programming Tools - Web Servers, ASP, Java
Languages - C, C++, Perl

OFFSHORE DIGITAL SERVICES provides competitive salaries, benefits, and a bonus program designed to encourage long-term employment and increased customer revenue. Interested? Send a detailed resume with post applied for, education background, project experience, and geographic preferences to:

OFFSHORE

THE PERSONNEL MANAGER
OFFSHORE DIGITAL SERVICES, INC.
14798 Wicks Boulevard San Leandro, CA 94577
Fax: 510-483-1819 Email: personnel@odsi.com

A 30 year record of quality people like you.

We know you're in demand. So demand the best environment for your growth: IT consulting with an international leader. We're everywhere business and industry are, with offices all over the country. So you've always got a new set of challenges, with total support. We're currently recruiting the following professionals: Programmer/Analysts; Application Development Specialists; Database Analysts; Business Analysts; Technical Support Specialists; Operations Specialists; Operations Specialists; Specialists; Operations Specialists; Network Administrator/Specialists; Software Engineers; and Lead Analyst Programmers.

Find out more about the rewards of working with Ajilon. To apply for positions in any of our district offices, please see our website at www.ajiion.com If you're interested in reloca-tion opportunities, don't hesi-tate to call 1-800-797-2342 or tate to call 1-800-797-2342 of forward your resume to: Ajllon, Dept. CW1, 550 American Ave., Suite 301, King of Prussia, PA 19406; Fax: 1-800-798-2342; E-mail: natIdept@nrec.ajllon.com An equal opportunity employer.

DCOM)
Job opportunities are also available for Sales Managers, Business Managers, Human Resources Managers, Controllers and Technical Recruiters. Bachelor's or Master's degree required, depending on position. We also accept the foreign educational equivalent of the degree, or the degree equivalent in education and experience. Excellent benefits. Send confidential resume and salary requirements to: CyberTech Systems, Inc., 1111 W. 22nd Street, 8th Floor, Oak Brook, IL 60523 OR 8 Neshaminy Interplex, Suits 209, Trevose, PA 19053. An equal opportunity employer.

Information Technology Professionals



IT is here. IT is everywhere. IT is constantly changing. You can't escape IT.

What is IT? IT is I.T.-Information Technology. Whittman-Hart is Information Technology.

We are IT.

Join Whittman-Hart, Inc., one of the country's premier providers of information technology services. Multiple career openings are available now throughout the U.S. for experienced IT professionals with the following skills:

AS/400 RPG BAAN **BPCS** New Media

OCM

Oracle

Network Engineering SYNON Technical Writing Training Web Development Peoplesoft Year 2000 Progress

Management

Lotus Notes Manufacturing SAP Software Testing & QA Strategic Consulting Domino

Retail Consulting

ED1 **Electronic Commerce** IT Architecture Instructional Design JD Edwards

If you want challenging assignments, excellent salary and benefits, including medical/dental/vision insurance, continuing education, FSA, 401(k), ESPP, and many opportunities for growth and promotion, we need to talk. Whittman-Hart offers it all. For consideration, please forward your resume to:

Whittman-Hart, Inc. International Operations 311 South Wacker Drive Suite 3500 Chicago, Illinois 60606 Fax: 312-913-6677

E-mail: resume@whittman-hart.com

Visit our web site at: www.whittman-hart.com

An Equal Opportunity Employer

Whittman-Hart We are 11

ProSoft Technology Group is a professional software consulting company providing high quality consulting services throughout the United States. We offer competitive salaries, full benefits and a team-spirited, success driven environment. We need Programmer Analysts, Software Consultants, Database Administrators and Software Engineers with 18 months experience in one or more of the following skills: following skills:

IMS DB/DC or DB2, CICS, COBOL,

DBA

Oracle Database, Data Modelling, Logical Database Design

Midrange AS400, RPG/400, COBOL/400

SAP R3, Basis, ABAP/4 (MM, SD, FI)
SAP ABAP/4, BDC, Data Dictionary, SAP Scripts, Reporting SAP R/3-Functional, Configuration and ABAP-Finance

Oracle Financial, Oracle Manufacturing

Client Server Visual Basic SQL Server Designer 2000 UNIX, C, C++, VC++, OOAD

Novel NetWare or Win NT Administration Net Dynamics

Java, HTML, Active X or E-Commerce

Multiple positions exist. Programmer Analyst positions requires a Bachelors or equivalent. Software Consultant, Software Engineer, DBA positions require Master or equiv-

Please mail your resume clearly mentioning the reference number CW092799 to: Attn: Georgia Nelson, Prosoft Technology Group Inc., 2001 Butterfield Rd, Suite 1050, Downer Grove, IL 60515.

PEOPLESOFT
CONSULTANTS
Retained Search For
International Consulting Co.
All Levels:
Staff up to Partners.
Offices Nationwide.
Live Anywhere in USA.
Relocation Assistance Availab
Travel Varies 0%-100%
Confidentiality Assured.
Peoplesoft Consulting
Experience is Required.
No Charge - Employer Retain
Send Confidential Resume.
ALLIED SEARCH, INC.
P.O. Box 472410 P.O. Box 472410
San Francisco, CA 94147
Fax: 1-415-921-5309
Email: alliedsrch @ aol.com
Questions (If Any)
Tel. 1-415-921-1971

testing procedures, program-ming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience in job offered or as a computer profes oriered or as a computer protes-sional as well as one year of experience using: 1 of Group A and 1 of Group B and 1 of Group C; OR 2 of A and 1 of B; OR 2 of A and 1 of C as follows: Group A - DB2, IBM3090, IBM ES9000, MVS, IMS, IDMS; Group B - CL/400, CICS, TSO, VSAM; Group C - TELON, COBOL, JCL, AS/400, RPG/ 400, COBOL/400. Master's 400, COBOL/400. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics. Will accept Bachelors with 5 years of progressive experience as a computer professional. Salary is \$75,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Duane Brentzel, Mgr., Office of Employment Security, 599 Sells Lane, Greensburg, PA 15601. Reference Job Order No.: 5027736

Senior Software Engineers (4) openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation using relational data base management systems (RDBMS). Work involves extensive travel and frequent relocation. Must have I year of experience in job offered or as a computer professional as well as 1 year using 1 from Group A and 2 from Group B OR 1 from A and 2 from Group B OR 1 from A and 2 from Group B OR 1 from A and 2 from C OR 1 from A and 2 from B and 1 from B and 2 from C OR 1 from A and 2 from B and 2 from C OR 1 from A and 2 from B an Senior Software Quality Assurance Engineer (multiple openings). Req. MS in Electronic Engineering, Computer Sci., or Operations & Eng. Mgt. Also requires 2 yrs.' exp. in offered job or 2 yrs.' exp. in software testing. Ir. lieu of master's and 2 yrs.' experience, will accept bachelor's degree in stated field plus 5 years of progressive experience as specified. Experience must include use of simulation & modeling techniques for validating embedded microprocessor controlled pulmonary & respiratory health care products; software & test protocol development & automation; and testing optimization techniques using Taguchi methods. On behalf of a manufacturer and marketer of embedded microprocessor controlled pulmonary and respiratory health care products, monitor the software development process to ensure that software and test protocol development and automation activities achieve company's quality control standards. Designate the protocols, simulation and modeling techniques to be used by test engineers to ensure validation under FDA, ISO and other relevant industry standards for these product lines (incl. Spirometry, Concentrator, Cryogenic & Telemonitoring). Supervise the adherence to testing protocols incl. testing optimization techniques using Taguchi methods. Establish policies for AJILON www.ajilon.com CyberTech Systems, Inc. provides IT Strategy consulting, systems integration and software development to clients nationwide. We have immediate, full-time opportunities for both entry-level and experienced professionals in any of the following areas: Functional (Financials, Logistics, HR)
 Technical (BASIS, ABAP, Senior Software Engineer (3 openings): Design, develop and implement computer software systems to determine feasibility of design and directs software ALE/EDI) NETWORKING Systems Engineers (MCSE)LAN/WAN Specialist (CISCO) APPLICATION DEVELOPMENT Microsoft Certified Solution
 Developer (Visual Basic,
 Visual C++)
 Database Administrators
 (Oracle, SQL Server)
 Web Based Development
 (Java or JavaScript, CORBA, methods. Establish policies for dev. of software used in product and process testing. Ensure quality validation of entire process from a global standpoint spanning product design through technology transfer and manufacture based, in part, on product information from test engineers. Liaise with regulatory affairs, manufacturing, and marketing regarding quality oft ASP, ActiveX, COM/ ry affairs, manufacturing, and marketing regarding quality assurance issues. 40 hrs./wk. Hrs. 8:00-5:00 M-F. Sal. \$61,525 to \$65,000/yr. dep. on educ. & exp. Send resume to Mrs. J. Gaston, Division of Workforce Development, 4040 Seven Hills Drive, Suite 166, Florissant, MO 63033. Refer to Job Number 184363.

IT CAREERS MIDWEST

Networking Consultant (multiple openings) to consult with client to define need or problem; conduct studies to obtain & analyzedata to advise on or recommend solutions; determine custom software solutions & report findings & recommendations to client; assist in implementation of solutions; network planning & troubleshooting; & installation of Microsoft Windows NT servers, Novell NetWare servers, Oracle servers, Microsoft SOL servers & UNIX servers; Regs. Master's in Comp. Sci., Systems Analysis, Comp. Info. Systems, Mgmt. Info. Systems, Systems Management, Computer Engg., Electrical or Electronic Engg. or Mathematics or its equiv in educ & exp. plus 3 yrs exp in job offered. Will accept a bachelor's degree or foreign equividegree, followed by at least 5 yrs progressive exp in the specialty, in lieu of the req'd educ. & exp.; \$63,732/yr, 40 hrs/wk, 8a-5p. Submit resume of C.V. to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila., PA 19123, J.O. #7055274

SAP Consultant (multiple openings) consult with client to define business need or problem relating to sales & distribution application; analyze business processes & document flow, & prepare functional specifications for same; design, develop & customize information structures using SAP (Systems, Applications & Products) module; perform data conversion from existing system to newly defined SAP system; assist in implementation of solutions; & report findings & recommendations to client; Reqs. Master's in Comp. Sci., Comp. Engg., Systems, Mgmt. Info. Systems, Business Administration, Management, Finance, Accounting, Statistics or Mathematics plus 1 yr exp in the job offered; \$63,732/yr, 40 hrs/wk, 8a-5p. Submit resume of C.V. to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila., PA 19123, J.O. #8055542

Roseland Computer Center, a software development and computer consulting organization is looking for IT professionals for placement in NJ and elsewhere. Immediate long term positions are available in the following areas:

SAP R/3
(FI/MM/ABAP/ITR/Basis)
Oracle/VB Developer
MCSE (Part Time/Full Time)
Technical Recruiter/Sales (prio
proven track record required)

Minimum 1 year software experience and engineering/ computer science degree. For SAP positions 1 year functional experience in manufacturing or finance additionally required. MBA a plus.

Respond to work@roseland.com.

Programmer Analyst required by Software Consulting Company. Duties: System administration, analysis & design of Computer software: SOR & ORACLE applications & development; BSCS in functional & technical areas; upgrading the existing systems, system documentation, monitoring database & maintenance of applications. Job to be performed in Lebanon, NH & other unanticipated client sites throughout U.S. es assigned. Requirement: A bachelors oegree in either Computer Science or Maths or Engineering or Comm or Physics & two years experience in the job offered. Selery. 65,000/Year. Hours. 40 Hours/Week; 9:00 AM - 5:00 PM. Responses to be submitted in two (2) copies of Resume/letters of application to: JOB ORDER # 99-303. P.O. BOX 989, CONCORD, NH 03302-0989.

SAP Consultant (multiple openings) to consult with client to define business need or problem relating to manufacturing application; analyze business processes & document flow, & prepare functional specifications for same; design, develop & customize information structures using SAP module; perform data conversion from existing system to newly defined SAP system; assist in implementation of solutions; & report findings & recommendations to client; Reqs. Master's in Comp. Sci., Systems Analysis, Comp. Info. Systems Analysis, Comp. Info. Systems, Mgmt. Info. Systems, Business Administration, Management, Mech. Engg., Indus. Engg., Manuf. Engg., Computer Engg., Electrical or Electronic Engg., Statistics or Mathematics; \$63,732/yr, 40 hrs/wk, 8a-5p. Submit resume of C.V. to The Phila. Job Bank, 444 N. 3rd St. 3rd Fl., Phila., PA 19123, J.O. #8055543

SAP Consultent (multiple positions) to consult with client to define business need or problem relating to financial/accounting application; analyze business processes & document flow, & prepare functional specifications for same; design, develop & customize information structures using SAP module; perform data conversion from existing system to newly defined SAP system; assist in implementation of solutions; & report findings & recommendations to client; Reqs. Master's in Comp. Sci., Comp. Engg., Comp. Mgmt., Systems, Analysis, Comp. Info. Systems, Mgmt. Info. Systems, Financial Info. Systems, Bus. Admin., Mgmt., Finance, Accounting, Statistics or Mathemetics or its foreign educ equiv; \$63,732/yr, 40 hrs/wk, 8a-5p. Submit resume of C.V. to The Pnila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila., PA 19123, J.O. #9101368

SOFTWARE ENGINEER to design, develop, test, implement and support client server application software for revenue manegement systems using C/C++ and object oriented programming in client/server UNIX environment with GUI X-Windows, Motif, Oracle and PowerBuilder, and Korn /C shell scripts and languages C/C++, SOL, 4GL and perl using relational database systems, object oriented design and software engineering concepts; evaluate clients' needs, analyze requirements and develop software systems following design specifications. Require: B.S. (or equivalent) in Computer Science and two years experience in the job offered or as System Analyst, or any experience providing skills in above duties. Salary: \$60,000 per year, 8 am to 5 pm, M-F. Mail resources, Talus Solutions, Inc., 4751 Best Road, Suite 300, Atlanta, GA 30337 (Ref. VV99).

PROGRAMMER/ANALYST to analyze, design, develop, install, maintain and support application software for the healthcare and telecommunications industries using Visual Basic, Oracie, SOL-Server, MS-Access and Crystal Reports under Windows and DOS operating systems; Train users. Require: B.S. (or equivalent) in Computer Science/Engineering, or a closely related field, with one year of experience in the job offered or as a Programmer. Three years of college education with an additional three years of experience in the field will be considered equivalent to the B.S. degree. Extensive travel on assignments to various unanticipated client sites within the U.S. is required. Salary: \$60,000/yr., 8 em to 5 pm, M-F. Send resume to: Raghavendra Kulkarni, President, Pro Softnet Corporation, 3235 Satellitte Bivd., Bidg. 400, Suite 300, Duluth, GA 30096; Attn: Job MS.

Experienced IT Professionals wanted:

Software Engineers, Programmer/Analysts, DBA's, Unix Administrators with one or more of these skills, UNIX, Oracle, Sybase, MS SQL Server, VisualBasic, VC++, PowerBuilder, JAVA, HTML, ASP, Object Oriented Design experience with CORBA etc.

Send resumes to: Multiphase Technology Corporation, Attn: Recruiter, 312 Quaker Church Road, Suite A2, Randolph, NJ-07869 Computer Programmer Analysts wanted - Bachelor's degree (or equiv), excellent communication skills, & 2 yrs experience developing customized client-server applications required. Position 1: Exp in PowerBuilder, PowerTool & Oracle Rqd; Position 2: Exp in Access, Visual Basic & Sybase Rqd; Respond to Box 100, CMC-I, 70 West Red Oak Lane, White Plains, NY 10604

Senior Software Engineer. Design, plan and develop computer programs using development tools such as PowerBuilder and Oracle relational database on Unix and Windows NT environments to evaluate financial systems. B.S. (comp sci. eng. rel field/equiv) and 5 yrs exp. (or 5 yrs exp as Software Engineer or Programmer Analyst). 40 hrs/wk. Send resume to: Human Resources, Unicom, Inc., 2 Lucy French Way, Ashland, MA 01721.

Programmer Analyst - Ft. Lauderdale, FL - Analyze user reqs, design, test & implement info mgt sys using NATURAL/ADABAS, Construct & Predict. Req. Bach in Comp. Sci., Matli or Commerce & 1 yr exp M-F, 8M-5PM, 40hrs/wk, \$40.00/hr. Send resume to: Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32303-0869, JO# FL-1998120

Programmer Analyst Central, KY - Under supervision, analyze user requirements, design, test & implement GUI applications for UNIX & Windows NT platforms using SYBASE & MS Access. Use Object Oriented Analysis & Design. Bach in Comp. Sci., Math or Engineering & 2 yrs exp. M-F, 9AM-5PM, 35 hrs/wk, \$58,000/yr. Send resume to: Jane Hosley, Ref. #1155, DES, 275 East Main St., 2W, Frankfort, KY 40621. Only persons with authorization to work permanently in the US need apply. Equal Opportunity Employer.

Practice Area Manager sought by Global IT Services Provider in New York City. Must have BS in Comp Sci or Math & 7 yrs exp managing Technology Services Division serving clientele in the finance, health & telecom industry. Respond to: Sharp Decisions, Inc - edna@sharpdecisions.com

Systems Analyst sought by Computer Services Co. in New York City. To provide n/work support for new & existing N/work servers using Win NT 4.0, Novell 4.X and LINUX OS. Must nave BE, BS or equiv in Computers. Respond by resume to: HR Dept, Software Services International, Inc, 17 State St, NY, NY 10004.

Software Engineer wanted by S/ware Systems Dvlpmt & Consulting Co. in East Brunswick, NJ. Must have Bach in Comp Sci, Math, Engg (any) or Chemistry & 5 yrs computer exp. (Masters w/2yrs exp also ok.) Respond to: HR Dept, Softsmile Systems, Inc, 197 Rte 18 South, Ste 3000, East Brunswick, NJ 98816.

Software Consultant needed F/T for Newspaper Publishing Co. in New York City. Must have Bachelor's in MIS & 2 yrs exp dvlpg, dsgng, testing & implmtg s/ware per specifications and analyzing, reviewing & rewriting prgms using C, C++, VisualBasic, Oracle 7, & Fox Pro. 9am-5pm 40hrs/wk. Respond to: Personnel, News India Media Ltd, 244 Fifth Ave, NY, NY 10001.

Systems Analyst needed by Textile Co. in Winston-Salem, NC. Must have Bach in Comp Sci or equivalent and 2 yrs exp modifying existing and dvlpg new computer prgms on AS/400 using RPG/400, RPG ILE, CL FTP & SQL. Respond to: HR Manager, Sara Lee Casualwear, A Div. of Sara Lee Corp, 1000 E. Hanes Mill Rd, Winston-Salern, NC 27105.

Field Applications
Engineer sought by
California-based
Embedded S/ware Co.
for job loc in Burlington,
MA. Must have BS in
Electrical Engg or Comp
Sci & 1 ½ yr software
support experience.
Respond by resume to:
HR Dept, AISYS, Inc,
4633 Old Ironsides Dr,
Ste 105, Santa Clara,
CA 95054.

S/W Engineer - Design, develop, test, & implement s/w packages to meet client needs and interface with existing client technology. Will use Java, Javascript, CGI, C++, and/or HTML as well as Remedy programing with AR using AR API. Reqs a Master's or equiv. In CS, Systems Analysis, or rel. field. Respond to: Human Resources, InteQ Corporation, One Van de Graaff Dr., Burlington, MA 01803.

Software Engineer wanted by Computer Services Co. in Edison, NJ. Must have 1 yr expanalyzing, dsgng & dvlpg comp. s/ware using C/C++ and Visual Basic & dvlpg Internet/Intranet applics using Lotus Notes and Domino. Respond by resume to: HR Dept, Horizon Companies, Inc, 5 Lincoln Hwy, Edison, NJ 08820.

Windows NT/Novell Instructor needed by Computer Training & Training Products Co. in Fairfield, NJ. Must, have Bach in Comp Scl, Comp Engg or Elec Engg & 6 mos exp preparing outline of instructional prgm & assembling material to be presented & conducting lectures of comp n/working using Win NT, Windows for workgroups, Win 95 & Novell working w/ TCP/IP. Respond to: Personnel, PC Age, LLC, 20 Audrey Place, Fairfield,

DATABASE PROGRAM-MER-needed by large IT firm to design, develop and implement large database application systems in UNIX based relational database environment. Develop and design softwere for database management using C, SOL, Embedded SQL and UNIX scripts. BS in Computer Science or Engineering with 2 years relevant exp. Reply to: Recruiting, UUNET, Inc, 100 Manhattenville Road, Purchase, NY 10577.

DATABASE CONSULTANT. Analyze, design, develop, test and debug dilent/ server datebase epplications using Oracle tools (Designer 2000, Developer 2000, Procedure: Builder, PL/SOL, ROBMS and Report Builder). Must have M.S. in Computer Science/Engineering and two years experience. Send resume to Mr. Clements et E- Content Corp., 61 Broadway, Suite 1400, New York, NY 10006.

Prog'er/Arialyst: Design, develop & test bus. & eng'g process situr applic'n w/Gemoase, Renaissance, MRP, ERP & Material Mgt; Design & develop People-Soft Financial products w/Oracle 7.2, C/C++ & Unix; Design chassis strain & stress enalysis situr w/Autodesk Mechan'l Desktop, PowerBuilder 4.0 & Oracle 9.0 on Win95 & NT; Design high level DB & table layout w/PowerBuilder/Oracle Forms & maintain, upgrade & re-engrexisting applica'n & provide interfaces to existing sys. 40h/w, 8-5, \$55k/yr, BS in Mechan'l Eng'g, 2 yr exp. in situr positin w/Gembase & Renaissance. Two resumes to Job Order #95-294, PO Box 989, Concord, NH 03302

computerworldcareers.com

COMPUTERWORLD

The 1999 Regional Conferences

Washington
DC
TECHNICAL
RECRUITING
A RETENTION
CONFERENCE

Monday, September 27, 1999
Fairview Park Marriott
Falls Church, Virginia

COMPUTERWORLD

New England

TECHNICAL RECRUITING CONFERENCE

COMPUTERWORLD

Monday, October 4, 1999
Boston Marriott Burlington
Burlington, Massachusetts



Monday, October 18, 1999 Wyndham Garden Hotel Dallas, Texas



Monday, November 8, 1999 J.W. Marriott Hotel - Lenox Atlanta, Georgia



Monday, November 15, 1999 Hotel Sofitel San Francisco Bay, California

For registration information call 1-800-488-9204

his conference program is developed exclusively for corporate human resource proessionals who recruit directly for their hining organizations. Vendors of selected, far eted products and services may participate through sponsorships and/or exhibits.

IT CAREERS MIDWEST



May 21-24, 2000



FOR MORE INFORMATION, CALL 1-800-488-9204

Computer Consulting Co. in Westmont, IL. Must have Bach in Comp Sci & Application & exp in dsgng, dvlpg & modifying distributed object s/ware for collection & distribution of data from multiple disparate systems. Respond to: Titan echnology, Inc, 98 E. Naperville Rd, Ste 202, Westmont, IL 60559.

Sr. Programmer sought by Houston, TX Co. involved in Application S/ware Dvlpmt Wholesale Food Distribution Industry. Must have MS n Electrical Engg or Comp Sci & 5 yrs programming exp. Apply to:
Henri D. Morris &
Associates, Inc, Attn:
Henri D. Morris, 5821 Southwest Fwy, Ste 200, Houston, TX 77057.

wanted by Retail Art Gallery & Auction Co. in Southfield, MI. Must have Bach in Comp Engg & 2 yrs software exp with FoxPro. Respond by resume to: Personnel, Parkwest 29469 Gallery, Northwestern Hwy. Southfield, MI 48034

Software Engineer



GE Capital Real Estate is a highly diversified business in its own right. We are all united by the concept of helping our clients' businesses succeed. Ecommerce presents an exciting way to blend the knowledge of today with the resources of tomorrow.

E-Commerce Director of Strategic Marketing
Responsible for assessing market opportunities for on-line commercial real estate products and services; designing/executing the creation, implementation, and management of the marketing strategy to maximize revenue; developing vendor relationships; and branding. Requirements: 2-4 years in financial services marketing as a brand, product, or sales manager; 5-7 years' experience in a Fortune 500 marketing department; outstanding leadership, presentation, communication and PC skills; an MBA in marketing; and proficiency in marketing research databases.

E-Commerce Project Leader

This position will manage large, complex projects that design and implement processes in support of GE Capital Real Estate's e-commerce program. Responsibilities: identify and develop e-commerce initiatives, products or services; initiate and manage new projects; documentation; and manage the project team. 5-7 years of project management experience; knowledge of business analysis techniques and quality tools; proven organization, management, analytical, problem solving presentation, and communication skills; and a BA/BS in problem solving, presentation, and communication skills; and a BA/BS in computer science, engineering or business are required.

We offer a competitive salary and benefits package. For immediate consideration, please forward your resume to: Ben Bendetti, Staffing Manager, GE Capital Real Estate, 292 Long Ridge Road, Stamford, CT 06927, e-mail: ben.bendetti@gecapital.com. No phone calls, please, An Equal Opportunity Employer



GE Capital Real Estate

We bring good things to life.

BLOCKBUSTER

Prgrmr/Analysts (all levels of exp.) - Dallas, TX - Develop various s/ware, including but not limited to, entertainment, business, data warehouse, using front-end, GUI & clt-server s/ware tools (Visual Basic, Visual C/C++, MFC, MS-SQL Server, Oracle). Write code & test plans, perform testing, implementation & provide tech. support; prep. specifications & documentation. Some positions require knowledge of mainframe envrnmt. May be required to use Crystal Reports, handle clt. feedback &/or sprvs. jr. prgrmrs. Must have Bachelor's degree in Comp. Sci., Engring., Math or related field. 1+ yrs. of exp. depending on position sought. 40 hr/wk (9-5). Competitive salary (commensurate w/exp.) w/excellent benefits.

Send resume & salary rqrm'ts.
to: Corporate Recruiter
BLOCKBUSTER Inc., 1201
Elm St., Dallas, TX 75270.
Ref# ISSSPAG

SENIOR NETWORK SPECIALIST

SPECIALIST

New Resources Corp. is seeking a Senior Network Specialist to design, configure and implement IT systems based on NetWare 3.x/4.1/4.1x/5.0, Window NT 3.5/4.0/2000 and Cisco Data/Voice integration hardware; evaluate new IT products and gauge their impact and feasibility; and write proposals and project plans for new implementations or upgrades of IT systems for executive team.

tems for executive team.

Requires BS in CS or Eng and 3
yrs. exp in the job offered or as
Network Admin. Fax or email
resume to Beth Razook at 847797-5835 or razookb⊕newres
ources.com EOE.

Project Manager - COBOL (Chicago metro area) (2 Positions)
Manage large scale COBOL/
CICS/IDMS projects involving
database and milenial conversion. Supervise scheduling of
and preparation of progress
reports and coordination of personnel. Consult with management and systems analysts to
identify progress goals and
maximize user effectiveness. 40
hr./wk. M-F, 9-5, \$61,000/yr. Requires Master's in Comp. Sc.,
Engineering, Math or MIS and 2
yr. exp. in job offered or related
occupation. Related occupation
includes Programmer Analyst/
Systems Analyst or Software
Engineer. Alternative education
/experience requirement includes B.S. degree in Comp.
Sc., Engineering, Math or MIS
and 5 yr. progressive experience in job offered or related
occupation. All candidates must
possess 2 yr. COBOL/CICS/
IDMS development experience.
Must have proof of legal authority to work permanently in the
U.S. No calls. Send 2 copies of
both resume and cover letter to
Illinois Department of Employment Security, 401 South State
Street-7 North, Chicago, IL
60605, Attn: Brenda Kelly, Ref.
#V-IL. 21332-K and/or V-IL20932-K. AN EMPLOYER PAID
AD.

SOFTWARE ENGINEERS Amdocs is a leading developer of software solutions for the telecommunications industry. More than 2,800 computer proon five continents and in more than 10 languages. Now is a great time to talk with Amdocs. We're growing. We're seeking team players with strong technical and personal skills for positions. tions in our St. Louis, MO office SOFTWARE ENGINEERS SOFTWARE ENGINEERS
Must have MS in MIS/CE/EE
or related & working knowledge
of C/C++, COBOL, Oracle
RDBMS, SOL, UNIX & Windows NT. Please contact: Amdocs, Inc.
Attn: Amos Galon, Timberlake
Corporate Center, 1390
Timberlake Manor Parkway,
Chesterfield, MO 63017-6041,

jobs@amdocs.com

CHIEF COMPUTER PROGRAMMER

CHIEF COMPUTER PROGRAMMER
Lead team of programmers to evaluate software projects. Perform system analysis, design architect, development, support, testing, implementation and tuning. Provide software solutions. Deploy Internet based applications. Write back end/middle ware programs. Perform database administration tasks. Prepare project estimates, project plan & Schedule documents, technical reports, code review documents, change management documents, user manuals and instructional manuals, Provide maintenance support. Debugging, modifications, fine tuning and code optimization. Work with Oracle 8, Developer 2000, Designer 2000, Oracle Financial Modules, Developer 2000, PowerBuilder, UNIX, PL/SOL, SQL, ADOBE, ACROBAT, HTML and OCX/ActiveX technology. Must be willing to travel and relocate as required. Several Positions available. REQUIRED: Master's Degree or equivalent with a concentration in Computer Science or Engineering or a

ave ducstions about your



Fran Quittel
Nationally Recognized Career Expert and
Computerworld's CareerAdvisor Columnist

With a lengthy background in high tech careers and recruiting, Computerworld's CareerAdvisor Fran Quittel specializes in providing in-depth information for job seekers and a "Recruiting Scoreboard" to help employers audit and improve their internal recruiting practices. Fran is author of the book Firepower: Everything you need to know before and after you lose your job and is the original creator of The FirePower Career Forum on The Microsoft Network. She also publishes career advice at www.careerbabe.com and tips for employers at www.yourcareer.com

Ask Computerworld's CareerAdvisor

This new feature appears every other week and is Computerworld's interactive career advice column. Simply submit your questions to Computerworld's CareerAdvisor at http://www.computerworld.com/career_advisor and yours might be answered in the print and online pages of Computerworld by nationally recognized columnist Fran Quittel.

COMPUTERWORLD

MARKETPLACE

For more information on advertising, call (800) 343-6474 Ext. 6000

ATTEMENTON

Attention! will page you, or call you on the phone when critical system or network problems occur.



www.attentionsoftware.com

- ✓ Supports UNIX, Windows NT, Windows 95/98, OpenVMS and OS400
- Notification via numeric and alpha pagers, telephones, and custom methods
- ✓ Interfaces with all leading system/network management products
- Unlimited escalation guarantees the right people are contacted

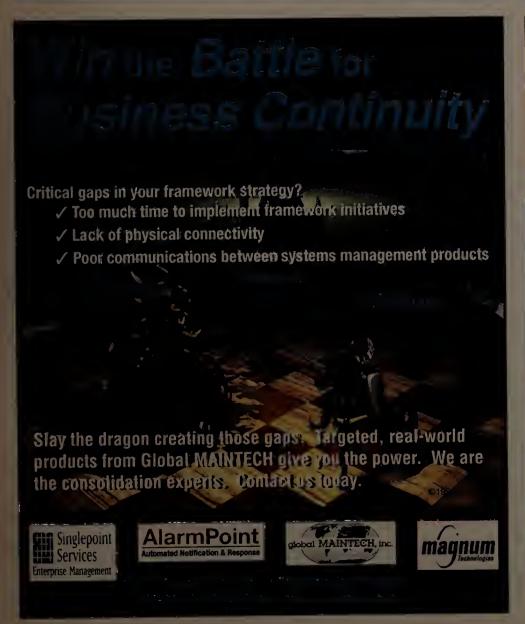
- ✓ Personnel call in to *Attention!* to acknowledge receipt of page
- ✓ Fault tolerant design supports redundant

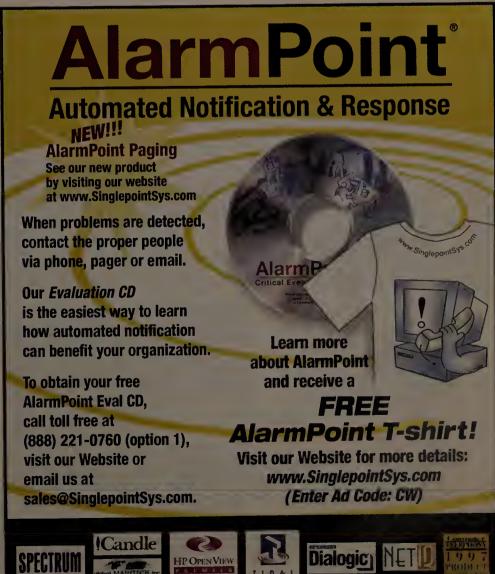
 Attention!* servers for immediate failover
- Event filtering suppresses redundant notification for same problem
- Heartbeat monitoring guarantees systems and critical applications are running 24x7

2175 N. Academy Circle • Suite 100 • Colorado Springs, CO 80909 (719) 591-9110 • fax (719) 591-9590

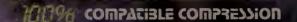
ALLENION

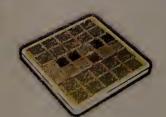
Call for free demo software 800-684-1684





For more information on advertising, call (800) 343-6474 Ext. 6000





PKAIP MVS



he same algorithmic technology that made PKZIP DOS famous now drives enterprise networks onboard OS/390 CMOS processors.

With PKZIP MultiPlatform from ASi, you can compress and transfer data across 11 platforms from MVS to Windows. In today's harsh open systems climate, it's much more than just something nice to have.

Start your FREE EVALUATION today.



888-278-2203 EXTENSION 200

ASCENT SOLUTIONS Inc. Internet: www.asizip.com · E-mail: sales@asizip.com

AS/400 • DOS • Mac • MVS • NetWare • OS/2 • UNIX • VM • VMS • VSE • Windows

The agency of the best freelance



Freelance Technologies

Major clients, Best rates

Excellent missions

Nationwide presence

Agencies worldwide

Web site: 100% free of charge

www.freelance.com

AWARDS! Prosoft / Novell Co

1997, 1998, 1999 WINNER... Gold Award for Self-Study Course of the Year from the Institute for I.T. Training

1998, 1999 WINNER... Silver Award for Training Company of the Year from the Institute for I.T. Training

"An exceptionally well-written CBT course!"-Inside Technology Training

"Definitely a Cadillac in its category!"— MCP Magazine

RATED OUTSTANDING by Inside Technology Training

TESTIMONIALS!

"The quality of the CBT courses is very high. We were also impressed with the range of courses offered." - Diane Pilot, British Airways

'These CBT courses are unbeatable!' Jim Rodgers,

Codeveloped with industry Leaders

- Hands-On Exercises
- Hundreds of Practice Questions
- Self-Paced Study Format Unlimited Telephone Tutoring
- . Money-Back Guarantee* Lucent Technologies

Computer-based Training Courses Include: MCSE, CNE, A+, Network+, Cisco and more!

*For Details On Our Money-Back Guarantee and A Free Catalog Call Today!

Toll Free 1-877-TRAINING Toll Free 1-877-872-4646

www.it-train.com

MCW

Maximize The Efficiency Of Your Help Desk!

Free Demo Augrantees The Solutions To Your Worst Problems

Track-Iti, your ail-in-one Help Bask software tool, puts an end to your Help Bask problems and increases your efficiency almost overnight. For example...

"i chose Track-Iti Why? Three reasons.
First, it offers e lot of bang for the buck.
Second, the eudit clients feeture was key.
Third, it is easy to install, eesy to use end I cen configure it on the fly. I recommend it without hesitetion." Jeanie Roberts-Wyatt,
 Volvo Truck Finance NA

"We considered meny eiternetives, but Treck-iti was the only single product that met all of our Haip Dask and inventory ne David Rose, United Way

"We're using it to manage our Help Desk tickets across locations in 4 stetes. It's doing everything you seld it would do and we're very pleased" "Jim Perry, GTE



Track-It! software for Windows NT/98/95 includes tightly integrated modules for:

- Help DeskPC Inventory
- LAN/Y2K Audit

- Web Support
 Reporting & 3D Graphing
 Purchasing, Knowledgebase and more

Download a fully-functional demo at www.blueocean.com/demo/cwa.html Request a demo CD by calling 813-977-4553 or faxing to 813-979-4447 When calling or faxing, ask for the "CWA Demo"

MARKETPLACE

call (800) 343-6474 Ext. 6000

Mainframe Outsourcing: OS/390, VM, VSE

Year 2000: Mainframe Conversion Testing Environment

Network Design, Installation & Maintenance Services

Hospital Data Center Outsourcing Services

Tape Conversions & Duplication

Remote Computing Services

Alicomp The Alternative to Large IT Vendors

Cost Effective

Low Risk Migration

Competitive Pricing

Flexibility - Reliability - Trust

Highest Quality of IT expertise and service

Hands-on executive involvement in vendor/client relationships

Call for a free brochure 1 (800) 274-5556

www.alicomp.com

Customized Personalized Information Technology Solutions



It all comes down to questions. Questions that challenge your expertise about Microsoft products. Question yourself - are you ready? Be absolutely sure. With Spike and the gang's certification guarantee, you will be. Because once you've completed the program, you'll pass with flying colors or get your money back.* And don't worry, because as Microsoft Certification changes, Transcender will have you covered...without question.

- Most Realistic MCSE and MCSD Simulations Available
- Detailed Answers and Explanations
- NEW! Computer Adaptive Testing Features
- . NEW! Simulation Questions
- Money Back If You Don't Pass Guarantee*

Transcender. America's #1 Exam Preparation Software.

Transcender

To order, call Howard @ (615) 726-8779 or fax (615) 726-8884; 242 Louise Ave.; Nashville, TN 37203

**Order, call Howard @ (615) 726-8779 or fax (615) 726-8884; 242 Louise Ave.; Nashville, TN 37203

**Order, call Howard @ (615) 726-8779 or fax (615) 726-8884; 242 Louise Ave.; Nashville, TN 37203

**Order, call Howard @ (615) 726-8779 or fax (615) 726-8884; 242 Louise Ave.; Nashville, TN 37203

**Order, call Howard @ (615) 726-8779 or fax (615) 726-8884; 242 Louise Ave.; Nashville, TN 37203

**Order, call Howard @ (615) 726-8779 or fax (615) 726-8884; 242 Louise Ave.; Nashville, TN 37203

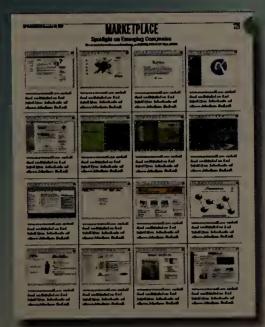
**Order, call Howard @ (615) 726-8779 or fax (615) 726-8884; 242 Louise Ave.; Nashville, TN 37203

**Order, call Howard @ (615) 726-8779 or fax (615) 726-8884; 242 Louise Ave.; Nashville, TN 37203



De e le 6, 1999

Cose is November 1, 1999.



for more information call the MarketTeam at 800.343.6474, extension 6000, e-mail at www.computerworld.com/marketteam. In Canada, call 508.820.8249.





Computerworld MarketLink makes IT easier!

For advertising information, call 1-800-343-6474, ext. 6000, in Canada, 508-820-8249

DISTRIBUTOR

for Mature PC-Based **BUSINESS CONTINUITY** & RECOVERY PLANNING

SOFTWARE

with Worldwide Usage CONTACT:

TAMP Computer Systems Inc. 516.623.2038 Fax: 516.223.2128 www.drsbytamp.com

SALES OFFICES

Computerworld Headquarters:

500 Old Connecticut Path, PO Box 9171, Framingham, MA 01701-9171 Phone: (508) 879-0700, Fax: (508) 875-4394

SVP/Publisher

Peter C. Horan

Vice President/Associate Publisher - West Elaine R. Offenbach

Regional Vice President Southwest Michele Gerus

EAST

DIRECTORS: Isabelle Kane, Laurie Mannone; SALES DPERATIDNS MANAGER: Leslie Murray; FIELD MARKETING EXECUTIVE: Nathaniel Hampson; SALES ASSOCIATE: Samantha Hadley, 500 Dld Connecticut Path, Framingham, MA 01701 (508) 879-0700 Fax: (508) 270-3882 TDD: (800) 428-8244

OIRECTOR: Lisa Ladie-Wallace, 5242 River Park Villas Dr., St. Augustine, FL 32092, (800) 779-5622 Fax: (800) 779-8622

OIRECTOR: Fred LoSapio; DISTRICT MAN-AGER: John Bosso; FIELD MARKETING EXECUTIVE: Maureen Grady; SALES & DFFICE ASSOCIATE: Susan Kusnic; SENIDR SALES ASSDCIATE: Jean Del-larobba; SALES ASSDCIATE: John Radzniak, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 Fax: (201) 587-9255, (201) 587-1289



OIRECTOR: Judith Hamerman; ACCOUNT OIRECTOR: Denyce Kehoe; SALES ASSOCIATES: Carrie Peterson; SALES OPERATIONS MANAGER: Emmie Hung, 177 Bovet Road, Suite 400, San Mateo, CA 94402 (650) 357-0200 Fax: (650) 524-7000 TDD: (800) 900-3179 SENIDR SALES ASSOCIATE: Jill Colley, 10900 N.E. 8th Street, Suite 820, Bellevue, WA 98004 (425) 451-0211 Fax: (425) 451-3822

Vice President/Associate Publisher - East Sherry Driscoll

> Vice President/Key Accounts Linda Holbrook

DIRECTOR: Blayne Long: SALES ASSOCIATE: Cathy Viox, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (847) 827-4433, Fax: (847)

DIRECTOR: Ernie Chamberlain; SALES ASSOCIATES: Claude Garbarino, Stefan Mayo, 177 Bovet Road, Suite 400, San Mateo, CA 94402 (650) 357-0200 Fax: (650) 524-7001 TDD: (800) 900-3179

> OIRECTOR: Jennifer Hedges; SALES ASSOCIATE: Doreen Robinson, 14651 Dallas Parkway, Suite 118, Dallas, TX 5240 (972) 233-0882 Fax: (972) 701-9008 TDD: (800) 822-4918

OIRECTOR: Cindy Wager; FIELD MAR-KETING EXECUTIVE: Robert J. Pietsch, 18831 Von Karman Avenue, Suite 200 Irvine, CA 2612 (949) 250-3942 Fax: (949) 476-

ADVERTISING OPERATIONS PRINT & ON-LINE

DISPLAY ADVERTISING CODRDINATOR: Peter Coen, (508) 879-0700 Fax:

BOSTON: Sales Dperations Manager/Maria McGrath; Faith Pasternak/ Event Dperations Manager, Senior Graphics Production Coordinator /Heidi Broadley; Editorial Director/Ellen Fanning, Managing Editor/Stefanie McCann, Dnline Account Executive/Gregg Pinsky, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 Fax: (508) 875-6310 SAN FRANCISCO: Sales Deprations Coordinator/ Nikki Wilson, 177 Bovet Road, Suite 400, San Mateo, CA 94402 (650) 357-0200 Fax: (650) 524-7000 EAST: Director/Peter Dxner, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (847) 759-2719, Fax:

MARKETPLACE/DIRECT RESPONSE CARDS

Sales Manager/Laurie Gomes, 500 Dld Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 820-8249 Fax: (508) 875-3701 EAST: Account Director/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-8278 Fax: 201-712-0430 MIDWEST: Account Director/Linda Clinton, 500 Dld Connecticut Path. Box 9171, Framingham, MA 01701-9171 (508) 820-8288 Fax: (508) 875-3701 CALIFORNIA, ALASKA, HAWAII: Account Executive/ Jason Bishop, 500 Dld Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 271-8009 Fax: (508) 875-3701 WEST: Account Executive/Maureen Roberti, 500 Dld Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 271-8007 Fax: (508) 875-3701

RECRUITMENT AGVERTISING SALES OFFICES

Dperations Director/Cynthia Delany, 500 Dld Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474 NFW ENGLANO & UPSTATE NEW YORK: Senior Account Executive/Nancy Mack 500 Dld Connecticut Path, Framingham, MA 01701 (800) 343-6474 MID-ATLANTIC: Regional Manager/Jay Savell, 4100 Ferncroft Lane, Bethlehem, PA 18020-7617 (610) 887-5288, Senior Account Executive/Caryn Dlott, (800) 343-6474 TDD: (800) 208-0288 SOUTH ATLANTIC: Regional Manager/Katie Kress-Taplett, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 280-5162, Product Manager/Pauline Smith (800) 343-6474 MIOWEST: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (847) 827-4433, Account Executives/Nicholas Burke (800) 343-6474 TDD: (800) 227-9437 WEST: Regional Manager/ Christopher Glenn, 177 Bovet Road, Suite 400, San Mateo CA 94402 (415) 665-2443. Account Executive/ Chris Connery, (800) 343-6474 MARKETING: Field Marketing Director/Derek E. Hulltzky, Marketing Director/Chris McGarry, Copywriter/Steve Stamates CIRCULATION: Vice President Circulation/Maureen Burke PRO-OUCTION: Production Director/Christopher P. Cuoco, Production Manager/Beverly Wolff DISTRIBUTION: Distribution Manager/Bob Wescott RESEARCH: IT Market Analyst/David Daoud, Research Analyst/Matt Duffy, Research Analyst/Candace D'Keefe

LIST RENTAL- PDSTAL: Rich Green, (508) 370-0832, e-mall: rich_green@idg.com, LIST RENTAL- E-MAIL: Christine Cahill, (508) 370-0808, e-mail: christine_cahill@idg.com, MAILING AODRESS: IDG List Services, P.D. Box 9151, Framingham, MA 01701-9151, FAX: (508) 370-0020

COMPUTERWORLD

President/CEO Michela O'Connor Abrams

Vice President/CIO Rick Broughton (508) 620-7700

Technical Recruiting Conferences John Corrigan (508) 820-8273

Senior Vice President/Publisher Peter C. Horan

(650) 524-7017 Vice President/General Manager Custom Publishing Ronald L. Milton

(508) 820-8661

Vice President/Editor in Chief Maryfran Johnson (508) 620-7724

Vice President Strategic Circulation Operations Eric Schmierer (508) 820-8217

Manufacturing Operations Carolyn Medeiros (508) 620-7733

Senior Vice President/ Finance & Operations Matthew C. Smith (508) 820-8102

INTERNATIONAL DATA GROUP

CHAIRMAN OF THE BOARD, Patrick J. McGovern

PRESIDENT/CEO, Kelly Conlin

Computerworld is a publication of International Dete Group, which informs more people world wide about information technology than eny other company in the world. With ennual revenues of \$2.35 billion, IOG is the leeding global provider of IT medie, research, conferences and expositions. 10G publishes more than 290 computer newspapers and magazines end 700 book titles in 75 countries, led by Computerworld/Infoworld, Macworld, Network World, CPC World, Channel World, end the "...For Oummies" global product lines. IOG online users the largest network of technology sites around the world through IOG net (http://www.idg.net), which comprises more than 225 targeted web sites in 55 countries, and its research arm, International Data Corporation (IOC) provides computantly research and analysis through 49 offices in 41 countries world wide. Compeny information is available at http://www.idg.com.

ADVERTISERS INDEX

000	rican Power Conversion	7
	Communications)
BMC	Software32/33 w.bmc.com	3
Brain www	Storm Group)
Cand	n34-35 v.canon.com	5
CapF ww	ock Enterprise Services 67' w.caprock.com	×
Am Mo	ago Directory	*
Com	paq Computer Corp. Brand	1
Com	paq Computer Corp. Portables 43, 74 w.compaq.com	ļ
Com	paq Computer Corp. Servers 50-51° w.compaq.com	je.
	outer Associates	7
Com	ouware13	2
ww	v.compuware.com	
Dell .	v.compuware.com	
Dell www	w.compuware.com 26-27	ŧ
Dell EDS ww.	w.compuware.com26-27° w.dell.com22-23, 30-31, 44-45	*
Dell www. EDS www. Greatww. GTE	w.compuware.com	* 5
Dell www EDS www Greawww GTE www	w.compuware.com 26-27 w.dell.com 22-23, 30-31, 44-45 w.eds.com t Plains Software w.gps.com internetworking	* 5
Dell www EDS www Greawww GTE www IBM	w.compuware.com	* 5 1 9 2
Dell www EDS www Grea www GTE www IBM www	w.compuware.com 26-27 w.dell.com 22-23, 30-31, 44-45 w.eds.com t Plains Software w.gps.com Internetworking w.gte.com Think Pad w.ibm.com Cross Server 85, 87	* 5 1 9 2 7
Dell EDS Grea WW GTE WW IBM IDG V WW INTE	### ### ##############################	* 5 1 9 2 7 5

Lockheed Martin
Lotus Development Corp
Merant
New Horizons
Oracle Corp
Pacific Bell
Peoplesoft
Progress Software
reSOURCE PARTNER
SAS Institute
SNET
Sprint25 www.sprint.com
Syncsort5 www.syncsort.com
Unisys
UUNET
Veritas65 www.veritas.com
Windows NT Advantage
*Regional Select Edition

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

HAVE A PROBLEM WITH YOUR COMPUTERWORLD SUBSCRIPTION?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

Computerworld, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here:	Address shown: Home Business			
NAME				
COMPANY				
ADDRESS				
CITY	STATE	ZIP		
Other Questions and Problems				

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: 1-800-552-4431

Outside U.S. call (740) 382-3322. Internet address: circulation@cw.com

COMPUTERWORLD allows advertisers and other companies to use its mailing list for selected offers we feel would be of interest to you. We screen these offers carefully. If you do not want to remain on the promotion list



WEEK IN STOCKS

National Data-34.8 Ariba Inc. (H)24.7 Documentum20.5 Banyan Systems Inc.15.4 Shared Medical Systems-18.3 Tibco Software Inc.-17.2 Cabletron Systems-15.3 America Online10.9 Apple Computer Inc. (H)-15.1 Telephone and Data Systems (H) ... 10.7 DOLLAR DOLLAR National Data-13.00 Ariba Inc. (H) 32.50 Yahoo Inc. 15.69 Apple Computer Inc. (H).....-11.69 Intuit-10.31 Shared Medical Systems-10.13 Telephone and Data Systems (H) ... 8.13 Priceline.com Inc. 6.56 Nextel Communications (H).....-9.53 Intel Corp.-9.50 Juniper Networks Inc. 4.06 Documentum3.75

Digital Rights Firm InterTrust Set for IPO

Need for technology may be key to success

BY MARK HALL

IKE MANY OF the Internet companies going public, InterTrust Technologies Corp., which has submitted documents to the Securities and Exchange Commission to become list-

ed as a publicly traded company, hasn't turned a profit. Yet, it is going to Wall Street soon to ask for much, much more.

As a high-profile, patentrich company with a successful product, InterTrust has a better chance than most to win big in its leap from the arms of venture capitalists to Wall Street's embrace, analysts said.

Founded in Sunnyvale, Calif., in 1990, InterTrust has focused on how to man-

From Losses to Loot?

Analysts say Inter Trust's profitless history is unlikely to dampen investors' enthusiasm for its forthcoming IPO:
Net Losses

5
10
\$1.59M
\$3.58M
\$3.58M

5
10
\$11.7M

15
20
1994
1995
1996
1997
1998

age and protect digital information. It has built a product and a patent portfolio with some \$80 million of investors' money, according to documents filed with the SEC. Revenue since 1994 has ranged from a low of zero in 1995 to a high of \$1.1 million in 1997. Last year's revenue was \$152,000.

PublishOne Inc. in nearby Santa Clara is a developer that uses InterTrust's Digi-Box software to help financial and market research companies manage digital rights to their high-priced reports.

CEO Kirk Loevner said InterTrust's product lets users establish both business rules

and usage rights for any kind

of digital content. Loevner said that distinguishes it from its competitors, such as AT&T's a2b technology, that only secure digitized music.

Glen Jennison, head of information technology and operations at Magex, a unit of the NatWest Group in London, agreed. "The DigiBox is a very sweet piece of software." Jennison said his company is "in the live proving stage," using DigiBox for documents being transferred between the company's outside attorneys and his headquarters' staff.

Analysts said InterTrust's luck going public should be bolstered by the widespread need for securing digital content.

According to John Powers, managing director at BancBoston Robertson Stephens in San Francisco, "Rights management is very, very important technology" that over time will see wider use inside organizations as well as outside, managing copyrights.

Loevner said he thinks IT adoption may come sooner than expected. "Budget and salary information are prime candidates" for IT to look at for digital rights management, he said.

EXCH	52- WEEK	RANGE		SEPT. 24 2 PM	WK NET CHANGE	WK PCT CHANGE
SOF	TWAR	E OFF	-3.9%			
AD8E	112.00	30 00	Adobe Systems Inc. (H)	108 38		2.0
AR8A	164.00	61.00	Ariba Inc. (H)	164.00		24.7_
AZPN	26.75	6.12	Aspen Technology Inc.	9 63		10.5
ADSK	49.43	21 62	Autodesk Inc.	22.00		-7.9
AVID	34.25	11.06	Avid Technology	13.50		-7.3
BMC5	71.75	30.00	8MC Software Inc. (H)	65.38		-5.4_
BDBJ	57.93	6.12	Businesss Objects S.A.	56.00		4.6
CON	36.00	9.12	Cadence Design Systems	13 69		-1.8
C8TSY	34.75	6.68	CBT Group Pic.	23.88		4.5
CHKP	96.50	10.87	Checkpoint Software Tech. Li	td. 83.75		-6.1
CTXS	69.93	23.12	Citrix 5ystems Inc. (H)	62.38		-7.6
CDGN	28.12	14.75	Cognos Inc.	22.0		10.7
CA	62.50	30.37	Computer Associates Int. Inc	. 55.75		-4.4
CPWR	40.00	16.37	Compuware Corp.	28 6	3 -3.75	-11.6
DCTM	54.12	9.37	Documentum	22.0	0 3.75	20.5
EFII	64.87	15.12	Electronics For Imaging	_56.13	-1.25	-2.2
HNCS	45.62	13.75	Hnc Software	36.0	0 -2.81	-7.2
HYSL	36.12	9.87	Hyperion 5oftware	20.5	0 _ 0.50	2.5
IDXC	53.50	12.43	IDX Systems	20.13	-1.94	-8.8
INFA	65.00	19.00	Infromatica Corp.	50 6	3 -8.63	-14.6
IFMX	14.00	3.75	Informix Software Inc.	7.7	5 -0.56	-6.8
INTU	110.75	36.25	Intuit	94.0	0 -10.31	- 9.9
JKHY	55.00	26.43	Jack Henry Associates	33.0	0 -1.25	-3.6
JDEC	49.50	10.87	J.O. Edwards & Co.	21.7	5 -1.69	-7.2
LGTD	50.37	13.75	Legato Systems Inc.	44.13	3 -1.88	-4.1
MACR	53.25	12.62	Macromedia Inc.	40.5	0 -4.88	-10.7
MANU	17.37	5.25	Manugistics Group Inc.	9.7	5 -1.25	-11.4
MENT	15.06	5.43	Mentor Graphics	8.2		-5.7
MSFT	100.75	43.87	Microsoft Corp.	91.13		-5.4
NETA	67.68	10.06	Network Associates	20.3	1 0.25	1.2
GMH	63.87	30.37	Network General	55.2	5 0.00	0.0
NOVL	31.18	10.18	Novell Inc.	20.1		
DRCL	46.93	15.00	Dracle Corp.	42.4	4 -1.00	-2.3
PMTC	22.25	8.50	Parametric Technology Corp			-12.3
PSFT	34.62	11.50	People5oft Inc.	17.1		0.4
PIXR	53.75	31.00	Pixar	37.2		
RATL	40.00	10.87	Rational Software Corp.	29.0		
RHAT	135.25	40.00	Red Hat Inc.	102.2		
5AP	47.62	23.75	5AP AG	36.6		
5CUR	29.00	2.25	Secure Computing Corp.	3.1		
5E	46.43	19.00	Sterling Commerce Inc.	19.1		
SSW	30.62	18.12	Sterling Software Inc.	20.4		
50RC	23.43	7.50	Structural Dynamics Research			-13.0
SYBS	13.43	4.50	5ybase Inc.	11.3		
5YMC	37.06	8.68	Symantec Corp.	32.0		-10.6
5NP5	65.12	26.93	Symaniec Corp. Symopsis	59.2		
	22.00	7.81	5ystems & Computer Techno			
5CTC			The Baan Co. N.V.	15.7		
8AANI		6.87		8.1		
VNTV	15.81	5.00	The Vantive Corp.	29.5		
TIBX	41.37	19.75	Tibco Software Inc.	25.8		-11.0
TSAI	51.00	24.18	Trans. 5ys. Arch. (L)			
VRT5	81.37	11.87	Veritas Software Corp. (H)	77.0 19.1		
WIND	34.43	11.25	Wind River Systems Inc.	19.1	U.0.	3.4

TELE	COM	MUNI	CATIONS CARRIERS	OFF -	2.4%	
AT	75.00	43.43	Alitel Corp.	67.56	-0.81	-1.2_
AIT	77.25	47.37	Ameritech Corp.	63.63	1.75	-2.7
ANDW	22.87	10.37	Andrew Corp.	17.00	0.19	1.1
T	64.12	37.50	AT&T	42.81	-2.75	-6.0
BCE	52.68	25.62	BCE Inc.	46.44	-4.06	-8.0
BEL	67.43	45.50	8ell Atlantic (H)	64.44	-0.13	-0.2
BL5	51.37	36.06	8ell 5outh	44.06	-0.69	-1.5
CSN	26.50	8.50	Cincinnati Bell Inc.	18.56	1.88	11.2
CMCSK	42.56	19.62	Comcast	34.19	-2.69	-7.3
CQ	39.62	25.75	Comsat Corp.	27.13		-24.7
COX	44.43	23.50	Cox Communications Inc.	39.13	-1.31	-3.2
65TRF	33.00	8.31	Globalstar Telecom. Ltd.	25.75	-0.13	-0.5
GTE	78.50	51.87	GTE Corp.	73.81	0.13	0.2
NXTL	76.00	15.37	Nextel Communications (H)	64.50	-9.53	-12.9
SPDT	45.43	26.37	Panamsat	39.00	1.00	2.6_
QCDM	199.00	18.87	Qualcomm (H)	190.63	4.25	2.3
58C	59.93	41.06	5BC Communications	48.69	-1.44	-2.9
FDN	57.43	30.56	Sprint Corp.	54.38	3.38	6.6
T05	86.75	30.62	Telephone and Data Systems (I		8.13_	10.7
TNI	46.56	12.00	Transation Network Services	39.13	-1.44	-3.5
U5W	66.00	51.12	U5 West	54.06	-2.75	· 4.8
VIA	49.62	25.43	Viacom	44.75	-1.00	-2.2
WCII	64.43	10.25	Winstar Communications Inc.	52.38	-4.00	-7.1
WCOM	96.75	39.00	MCI Worldcom Inc.	75.31	-2.81	-3.6

SERVICES OFF -4.79

ACXM	31.25	15.87	Acxiom Corp.	17.06	0.31	1.9
ACS	53.00	22.37	Affiliated Computer Servs	40.75	0.56	1.4
AMSY	40.25	19.25	American Mgt. Systems	24.06	-1.56_	·6.1
AUD	46.87	32.68	Automatic Data Processing	42.25	-0.31	-0.7
8SYS	60.87	35.37	Bisys Group Inc.	48.58	1.19	2.6
CATP	32.25	10.62	Cambridge Technology Ptnrs	14.13	0.88	6.6
CEN	40.50	24.00	Ceridian	26.44	-1.13	-4.1
CBR	31,18	13.31	Ciber Inc.	15.88	-1.38	-8.0
000	30.87	10.75	Comdisco	18.38	-3.13	-14.5
CHRZ	30.12	9.25	Computer Horizons Corp.	11.38	·1.13	-9.0
CSC	74.87	46.25	Computer Sciences	64.00	-0.06	-0.1
DST	70.25	34.00	Dst Systems Inc.	59.13	3.69	-5.9
EDS	67.37	30.43	Electronic Data Systems	53.69	2.94	-5.2
FDC	51.50	19.68	First Data Group	44.56	-3.00	-6.3
FISV	40.75	24.87	Fiserv	31.00	-0.88	-2.7
IT	25.75	14.25	Gartner Group (L)	16.75	-1.38	-7.6
KEA	50.12	17.25	Keane	22 63	-3.13	-12.1
NDC	55.25	24.38	National Data	24.38	-13.00	-34.8
PAYX	36.75	23.56	Paychex Inc.	32.44	0.19	0.6
PER	85.75	18.08	Perol Systems Corp (L)	18.06	-0.50	-2.7
REGI	15.06	3.68	Renaissance Worldwide	4.06	-0 19	-44
REY	25.31	14.43	Reynolds & Reynolds	20.88	-1.00	.4.6
SFE	120.00	17.12	5alegard Scientilics	71.00	0.50	0.7
SAPE	98.50	24.25	Sapient Corp. (H)	90.75	-0 63	-0.7
SMS	73.50	40 06	Shared Medical Systems	45.25	10.13	-18 3
SDS	41.93	21.37	Sungard Data Systems (L)	23.44	0.81	3.6
SYNT	24.31	7.00	5yntel Inc.	10 00	0.50	5.3
TECD	53.12	14.50	Tech Data	26.25	-0.31	-1.2
TENF	39.50	21.50	TenFold Corp.	25.25	0 94	-3 6
TSS	26.25	14 43	Total System Services Inc	14.75	0.69	45
TSAI	51.00	24 18	Transaction Sys. Architects (L)	25 88	3.19	-11 0

NETI	WORK	OFF	3.4%			
CDMS	51.12	20.00	3Com Corp.	27.00	-0 63	23
ADCT	53.62	15.75	ADC Telecommunications Inc.	40 50	-0 56	14
ANTC	51.12	11.50	Antec (H)	47 44	∙0 06	-0.1
BNYN	19 37	2 50	Banyan Systems Inc.	8.88	1 t9	15.4
CS	19 93	7.18	Cablatron Systems	16.63	3 00	15 3
CNEBF	9.75	3.93	Call-Net Enterprises	5.44	-0.13	-22
CSCD	73.56	20.56	Cisco Systems Inc. (H)	68.88	-356	4 9
ECIL	45 00	19 75	EC1 Telecom	27 00	-1.50	5.3
ENTU	43 06	9.00	Entrust Technologies Inc	22 56	0 56	-24
HRS	40 62	23 62	Harris Corp	27.56	250	10.0
GMH	63.87	30.37	Hughes Electronics/GM	55 25	0.00	0.0

EXCH	52- WEEK	RANGE		60 T I I' I' A	OFFER SAME	WK PCT CHANGE
EAUN	WELK	INCHUL				Gineral
ERICY	35 25	15.00	LM Encsson	31.25	0.50	t 6
JNPR	234.37	90.12	Juniper Networks Inc	188 19	4 06	22
LU	79.75	26.68	Lucent Technologies	64 81	5.19	7.4
MADGE	5.18	1.75	Madge Networks	2 38	-0 13	50
NCDI	8.50	4 25	Network Computing Dev	4 88	-0.13	25
NWK	13 68	7.31	Network Equipment Tech	8 81	0.31	3.4
NN	39 87	15 43	Newbridge Networks	26 13	0 00	0.0
NOK	99 37	29.50	Nokia Corp	88 44	1 25	1.4
NT	50.00	13.37	Northern Telecom Ltd. (H)	46 50	2.75	5 6
PAIR	16 12	6 00	Pairgain Technologies Inc.	t1 81	-1 19	91
PCTL	11.00	3 90	Picturetel	4 13	-0.38	83
5FA	58 81	11 75	Scientific Atlanta	48 44	-6 69	12.1
TLAB	74 00	15 68	Tellabs Inc.	58.38	-0.81	1.4
USW	66 00	51.12	US West	54 08	-2 75	4.8
VRLK	6.28	2.00	Verilink	2.31	0 75	-24 5
WSTL	11.18	2.75	Westell Technology Inc.	8 13	-0 44	5.1

SEM	ICOND	UCTO	RS, CHIPS & EQUIPME	NTO	FF-6	3.7%
ADPT	42.87	7.87	Adaptec	33.88	-3 75	10 0
A MD	33.00	9.31	Advanced Micro Devices	17.50	-2 88	-14.1
ALTR	55.68	14.75	Altera	46 63	-8.19	149
ADI	60.43	12.00	Analog Oevices (H)	56 25_	-3.06	52
AMAT	84.93	21.56	Applied Materials (H)	77.75	6.06	72
ASML	69.62	12.93	ASM Lithography Holding	64 63	0.25	0.4
HRS	40.62	23.62	Harris Corp	27.56	2.50	10 0
INTC	89.50	38.00	Intel Corp.	75.19	9.50	-11.2
KLAC	74.50	20.75	Kla Instruments	65 88	-7.13	·9 <u>8</u>
LLTC	75.75	19 56	Linear Technology	64 75	-3 19	-47
L51	62.50	10.50	LSI Logic	53.00	6 63	1t.1
MXIM	74.87	22.31	Maxim Integrated Products	67.94	-5 69	-7.7
MU	85 00	23.43	Micron Technology	78.63	169	2.2
MDT	101.18	38.37	Motorola	84.19	·5 B1	6 5
NSM	36.25	7 43	National Semiconductor (H)	31.63	-2.63	-7.7
STM	81.37	17.93	SG5-Thomson Microelectronics ((H)75.75		-3 3
SLR	78.93	21.12	Solectron Corp.	68.13	6.88	-92
TER	42.25	7.50	Тегафупе	36.88	-3.75	-92
TXN	93.43	22.68	Texas Instruments	82.00	-7.44	-83
JD5U	120 87	15.62	Uniphase	108.38	-2.34	-2.1
VT55	97.50	17.12	Vitesse Semiconductor Corp (H)	84 38	-7.50	8 2
XLNX	77.25	15.43	Xilinx	64 63	6.75	-9.5

COM	APUTE	R SYS	STEMS OFF -7.2%			85
AAPL	80.12	28.50	Apple Computer Inc. (H)	65.56	-11 69	-15.1
A5PX	13.31	1.62	Auspex Systems	8.75	1.06	10.8
BED5	10.93	5.87	Be Inc.	6.63_	-0.63	-8.6
CPQ	51.25	20.00	Compag	22.75	-1.50	-6.2
DGN	21.81	9.00	Data General	20.00	-0.19	0.9
OELL	55.00	20.37	Dell Computer Corp	44.00	-4.44	-9.2
GTW	54.75	18 06	Gateway 2000 Inc. (H)	43.06	-6.75	-13 6
HWP	118.43	47.06	Hewlett-Packard Co.	95.25	-8.19	-7.9
HIT	114.87	40.31	Hitachi Ltd. (H)	109.00	-0.06	-01
I8M	139.18	58.37	18M	123 50	6.75	-5.2
MUEI	24.75	9.00	Micron	12.06	-1.50	·11.1
MOT	101.18	38.37	Motorola	84 19	5.81_	-6.5
NATI	48.25	17.50	National Instruments Corp.	29.63	-2.75	8.5
NCR	55.75	26.12	NCR	30.50	-3.81	-11.1
NIPNY	106.00	31.00	NEC (H)	98.94	-1.06	-1.1
PRCM	13.25	3.43	Procom Tech Inc.	7.75	-0 88	-10.1
5QNT	19.00	5.68	Sequent Computer Systems	17.88	0.13	0.7
SGI	1580.55	11.00	Silicon Graphics Inc. (H)	11.00	-1.06	-88
5NE	160.50	60.25	Sony (H)	149.06	2.56	1.7
SUNW	94.68	19.50	Sun Microsystems (H)	89.63	0.13	0.1
TRCD	4.87	0.37	Tricord Systems	3.88	-0.56	-12.7
UI5	49.68	18.12	Unisys (H)	42.00	-6.44	13.3

INTE	RNET	OFF	-0.6%			
Seasonenande	Brown of the State					_
AMZN	110.62	13.37	Amazon.com	64 63	0.44	0.7
ADL	175.50	20.62	America Diline	95.69	9 44	10.9
ATHM	99.00	17.25	@home Corp.	36 44	·1.63	-43
CKFR	69.12	5.75	Checklree	40.25	-1 13	.27
CYCH	24.87	5.87	Cybercash Inc.	7.56	-0.44	.5.5
EDFY	16.87	3.81	Edify Corp.	11.81	-0.56	.45
EBAY	234.00	8.43	eBay Inc.	143.81	2.06	15
ETYS	85.00	28.12	eToys Inc.	59 00	-6.13	.9.4
EGRP	72.25	2.50	ETrade Group Inc.	22.56	0 13	.0.6
SEEK	100.00	16.62	Infoseek	28.06	-0 94	-32
LCDS	72.68	11.25	Lycos Inc.	45.56	1.25	2.8
DMKT	27 00	4.25	Dpen Market Inc.	12.69	·1.50	·10 6_
DTEX	42.50	10.00	Dpen Text Corp.	20 88	0.63	3.1
PCLN	165.00	53.50	Priceline.com Inc.	66.19	8.56	11 0
PRGY	50.62	14 00	Prodigy Communications	17 13	0.31	1.9
P5IX	73.75	8.37	P5INet Inc.	38 89	1.69	-4.2
SDTI	30.62	5.43	Security Dynamics	27 31	0.00	0.0
5PYG	32.25	8.62	Spyglass Inc.	11.75	-1.13	8.7
YHDD	244.00	48.75	Yahoo Inc.	178.75	15 69	96

ADPT	42.87	7.87	Adaptec Inc	33 88	-3.75	
APCC	27.75	13.12	American Power Conversion	19.25	-163	
CANNY	33.62	17.00	Canon Inc.	28 25	0 38	
D8D	39 87	19 12	Otebold Inc.	24 75	-0 t9	
EK	85.31	60.81	Eastman Kodak Co.	73 19	2 25	
EMC	75.62	20.81	EMC (H)	69 13	1.94	
DM	10 18	2.93	lomega	3.13	0.13	
MXTR	21.25	4 25	Maxtor Corp.	5 59	0.28	
NTAP	77.87	16.00	Network Applinace Inc. (H)	71 25	2 75	
LXK	87.25	25.37	Lexmark Int. Group No. (H)	84 25	3.50	ı
5EG	44 25	19 81	Seagate Technology	29 19	3 38	ı
STK	41.62	17 25	Storage Technology	20 38	0.94	
TEK	39.37	13 68	Tektronix (H)	31 63	-5 25	
XRX	63.93	39 75	Xerox	43 08	0 38	

KEY: (H) = New annual high reached in period
(L) = New annual low reached in period
Copyright Nordby International Inc., Boulder,
Colo. (nordby.com) This information is based on
sources believed to be reliable, and though extensive efforts are made to assure its accuracy, no
guarantees can be made. Nordby International and
Computerworld assume no liability for inaccuracies. For information on Nordby's customized financial research services, call (303) 938-1877.

RESOURCES

How to Contact Computerworld

TELEPHONE/FAX

Main phone number	(508) 879-0700
All editors unless otherwise	noted below
Main fax number	(508) 875-8931
24-hour news tip line	(508) 820-8555

E-MAIL

Our Web address is www.computerworld.com. All staff members can be reached via e-mail on the Internet using the form: firstname_lastname@computerworld.com.

All IDG News Service correspondents can be reached using the form: firstname_lastname@idg.com.

LETTERS TO THE EDITOR

Letters to the editor are welcome and should be sent to: letters@computerworld.com. Include your address and telephone number.

MAIL ADDRESS

PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

SUBSCRIPTIONS/BACK ISSUES

Phone	(800) 552-4431
E-mail	circulation@cw.com
Back Issues	(508) 820-8167

REPRINTS/PERMISSIONS

Phone.... Ray Trynovich (717) 399-1900, ext. 124 E-mail.....sales@rmsreprints.com

CONTACTING CW EDITORS

We invite readers to call or write with their comments and ideas. It is best to submit ideas to one of the department editors and the appropriate beat reporter.

Editor in Chief Maryfran Johnson (508) 820-8179 Editorial Oirector, Print/Online Patricia Keefe (508) 820-8183

DEPARTMENT EDITORS

News Editors	Michael Goldberg (508) 620-7789
	Anne McCrory (508) 820-8205
	Sharon Machlis (508) 820-8231
Business Editor	Kevin Fogarty (508) 820-8246
Technology Editor	Robert L. Scheier (508) 820-8226
Assistant News Editor	Mitch Betts (202) 347-6718
West Coast Bureau Chief	Mark Hall (650) 524-7110

REPDRTERS

General assignment, thin clients, travel industry	Stacy Collett (703) 404-1409
Careers, labor issues, outsourcing,	Stewart Oeck (508) 820-8155,
application service providers,	Julekha Oash (804) 295-9512
health care	
E-mail, groupware,	Oominique Oeckmyn (650) 524-7
workflow, document and	
knowledge management,	
food processors/supplier industry Mobile computing, desktop systems, aerospace, defense contractors	Matt Hamblen (508) 820-8567
Security, encryption, viruses IT management, year 2000, financial services	Ann Harrison (508) 820-8182 Thomas Hoffman (914) 988-963

E-commerce, energy/utilities Julia King (610) 532-7599 Network, systems management, Sami Lais (301) 270-1427 food industry, retail and restaurant Microsoft, investigative reports Kim S. Nash (773) 871-3035

Microsoft, NT, BackOffice, Novell, David Drenstein (650) 524-7116 nharmaceutical industry

General assignment, storage Kathleen Ohlson (508) 820-8215

Carol Sliwa (508) 628-4731

Databases and Unix Robin Robinson operating system (E-mail: robin.robinson

ERP, client/server software, Craig Stedman (508) 820-8120 Unix applications, process manufacturing State/federal government, Patrick Thibodeau (202) 333-2448 antitrust, legal issues, politics

Midrange and mainframe Jaikumar Vijayan (508) 820-8220 hardware, heavy manufacturing

DPINIDNS

Staff Columnist Frank Hayes (503) 252-0100 Columns Editor Allan E. Alter (508) 620-7714

FEATURES EDITORS

nagement, leadership Allan E. Alter (508) 620-7714 anagement, year 2000 Rick Saia (508) 820-8118 Cathleen Gagne (508) 620-7729 Reviews Russell Kay (508) 820-8175 Field Report, reviews, Cynthia Morgan (508) 820-8177

T Careers Oavid B. Weldon (508) 820-8166 IT Careers Mari Keefe (508) 828-4906 Special Projects Amy Malloy (508) 620-7754

Trianagement Kathleen Melymuka (508) 628-4931
Business, technology topics Gary H. Anthes (202) 347-0134
Business, technology topics Steve Ulfelder (508) 620-7745

RESEARCH

Lorraine Cosgrove, research manager; Laura Hunt, fibrarian, research analyst; Keith Shaw, graphics coordinator

CDPY DESK

Jamie Eckle, managing editor/production (508) 820-8202; Jean Consilvio, assistant managing editor/production: Pat Hyde, assistant managing editor/special projects; Jacqueline Oay, Julie Oennis, Michele Lee, Bob Rawson, copy editors.

GRAPHIC DESIGN

Tom Monahan, riesign director (508) 820-8218; Stephanie Faucher, art director/features; Mitchell J. Hayes, art director/news; John R. Brillon, Nancy Kowal, April O'Connor, David Waugh associate art directors; Julie D'Errico, graphic designer; Rich Tennant, John Klossner, cartoonists.

AOMINISTRATIVE SUPPORT

Linda Gorgone, office manager (ext. 8176); Connie Brown (ext. 8178); Lorraine Witzell (ext. 8139); Gussie Wilson (650) 524-7035, editorial assistants.

COMPUTERWORLD DNLINE

Tom Monahan, director, online and design (508) 820-8218: Sharon Machlis, online news editor (508) 820-8231; Kathleen Dhison, reporter (508) 820-8215; Jeremy Selwyn ne services manager; David Ramel, online production coordinate John Pallozzi, Web developer; Lisa Sydney, online researcher;
Aaron Bishop, audio englneer.

COLUMNISTS

Joe Auer, James Champy, Michael Cusumano, John Gantz, Dan Gillmor, Peter G. W. Keen, Bill Laberis, David Moschella, Fran Quittel, Paul A. Strassmann, Oon Tapscott, Ed Yourdon

COMPANIES IN THIS ISSUE

Page number refers to page on which story begins. Company names can also be searched at www.computerworld.com

SCOM CORP	29,7
AARON/SMITH ASSOCIATES INC	6
AB ELECTROLUX	. 90
ABEROEEN GROUP INC	2
ACNIELSEN CORP	1-
ACCPAC INTERNATIONAL	. 8:
ACME ELECTRIC CO	1:
AOOBE SYSTEMS INC.	6
AOP BROKERAGE	
INFORMATION SERVICES	
AETNA FINANCIAL SERVICES INC.	4
AETNA INC.	4
ALI OATABASE CONSULTING	
ALTAVISTA TECHNOLOGY INC.	8
ALTEON WEBSYSTEMS INC.	7
AMERICA ONLINE INC.	6
AMERICAN CIVIL LIBERTIES UNION	1
AMERICAN EXPRESS CO .	3
AMERICAN MANAGEMENT SYSTEMS	
AMERICAN STOCK EXCHANGE INC	9
AMERICAN STOCK EXCHANGE INC	6.
AMR RESEARCH INC	4.8
ANOERSEN CONSULTING	4,0
	24,29,9
ARCHIPELAGO LLC	4
ARTESIA TECHNOLOGIES INC.	4
ARTHUR ANOERSEN & CO	6.
	29,39 10
AT&T WORLONET	6
BANCBOSTON ROBERTSON STEPHE	
BANCO ITAU	6
BANK OF NEW YORK	6
BANK OF NOVA SCOTIA	
BANK UNITEO	4
BEAMSCOPE CANAOA	8
BELL ATLANTIC CORP	2
BELLINGHAM COLO STORAGE CO	4
BERNARO L MADOFF	
INVESTMENT SECURITIES	
BEST BUY CO.	1
BIOGENINC	6
BLOOMBERG LP	4
BMC SOFTWARE INC.	2
BORLAND INTERNATIONAL INC	9
BORN INFORMATION SERVICES GRO	
BP AMOCO PLC	9
BROADCOM CORP	7
BUSINESS DATA SERVICES INC	
CABLETRON SYSTEMS INC	7
CAHNERS IN-STAT GROUP	2
CANTO OFTWARE	4
CAP GEMINI AMERICA INC	2

CENTER FOR OEMOCRACY CENTER FOR OEMOCRACY
ANO TECHNOLOGY
CENTER FOR Y2K & SOCIETY
CHARLES SCHWAB & CO.
CHARLEVOIX AREA HOSPITAL.
CISCO SYSTEMS INC.
CITRIX SYSTEMS INC.
CLEARCOMMERCE INC.
CMM WORD DWOOF INC. CLEARCOMMERCE INC.
COMI WORLDWIDE INC.
COGOS CONSULTING INC.
COLLABORATIVE STRATEGIES LLC.
COMPAQ COMPUTER CORP.
COMPUSA INC.
COMPUTER ASSOCIATES
INTERNATIONAL INC. CONSOLIOATEO FREIGHT WAYS CORP.
CONSUMER-CONNECT GROUP
CONTRA COSTA COUNTY
CONVERGYS CORP COREL CORP
COUNTERPANE SYSTEMS.
CRYPTONYM CORP.
OAIMLERCHRYSLER
OATA GENERAL CORP OU PONT CO
OYNAMIC HEALTH CARE
TECHNOLOGIES INC
EARTHLINK NETWORK INC
EASTMAN KODAK CO

ELECTRONIC FRONTIER FOUNDATION
EMACHINES INC.
ENTERPRISE
APPLICATIONS CONSULTING
ERNST & YOUNG CENTER
FOR BUSINESS INNOVATION
ETOYS INC. FEOERAL TRACE COMMISSION
FINGERHUT BUSINESS SERVICE INC.
FIRST OATA CORP.
FLEET FINANCIAL GROUP INC.
FLOWMISE NETWORKS.
FORO MOTOR CO.
FORRESTER RESEARCH INC.
FORTE SOFTWARE INC.
FRIGIOAIRE HOME PRODUCTS ILLUMINATA INC.
INFORMATION OESIGN
& MANAGEMENT INC
INNOVATIVE OP OESIGNS INC. INTEGRATEO MEASUREMENT SYSTEMS INC. INTEL CORP

JOCKEY INTERNATIONAL INC.
JOHN'S NATURAL OOG TRAINING CO.
JUPITER COMMUNICATIONS LLC.
KENSINGTON TECHNOLOGY GROUP.
KENT STATE UNIVERSITY.
KLUB SERVICES INC.
KROGER FOOO STORES
LABTEC INC. LYCOS INC. MARCAM SOLUTIONS INC. | MICROSOFT CORP. | 4.8.12.20.29.32. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... ONSALE INC.
ONSIGHT...
OPEN MARKET INC.
OPTIMARK TECHNOLOGIES INC.
ORACLE APPLICATIONS
USERS GROUP
ORACLE CORP
4.
ORION AUTO PROBUSINESS SERVICES INC.. PROCTER & GAMBLE CO PRODUCTION TOOL SUPPLY PRUCENTIAL INSURANCE COMPANY QUOTE COM
RADIANT SYSTEMS INC
RAYTHEON SYSTEMS CO.
REAL WORLD INTELLIGENCE INC.
ROCKPORT TRADE SYSTEMS INC.
RUBIN SYSTEMS INC.
RUESCH INTERNATIONAL INC.
S C. JOHNSON & SON INC.
S T COOPER & SONS.
SAKS INC.

VIGNETTE CORP
VISUALIZATION TECHNOLOGY INC
VODAFONE AIRTOUCH PLC
W B MASON CO
WAL-MART STORES INC
WEBII INE COMMUNICATIONS CORE

Continued from page 1

PC Sales

work-connected handhelds and laptops, users and analysts said (see related story, page

The big reason: plunging desktop prices. Some of the most powerful Intel Corp. Pentium III desktops cost less than \$1,500, hundreds of dollars below prices of two years ago.

Last March, when IBM Chairman Louis Gerstner declared the "PC era is over," it raised eyebrows, especially with corporate PC managers. Gerstner refined his message to say that PCs wouldn't die off but that network systems would gradually replace them [News, April 5].

Shellie Sommerson doesn't buy such predictions. "Yes, I've heard people say the PC era is over, but I don't think it is by a long shot," said Sommerson, business systems manager at the Statesman Journal, a daily newspaper in Salem, Ore.

"Desktops are getting faster and able to do more at less cost. And there are still limits to laptops and other devices, so the PC will continue to be a part of the picture here for a long time," Sommerson said.

When network computers and thin clients surfaced three years ago, many users saw distinct security advantages. They could keep corporate data on a networked server, analysts said. But that thinking doesn't seem to matter as much today.

"Two years ago, vendors were pitching me thin clients for \$1,000, way below the \$3,000 of a full PC, but how can I get serious about a thin client today when I can pay \$1,200 to \$1,400 for a full-functioning PC?" asked Stephen Nulter, assistant vice president for information systems at Peoples Banking & Trust Co. in Marietta, Ohio.

All 500 Peoples Banking users, including tellers at 27 bank branches, use PCs because they need to have access to e-mail and run spreadsheets. "If the wide-area network is down, we want each teller to have as much functionality as **Ship Those PCs**

U.S. PC vendor shipments, Q2 1999

	SHIPMENTS	GROWTH*
Compaq	1.68M	+ 51.5%
Dell	1.65M	+ 51%
Gateway	845,000	+ 36.5%
IBM	845,000	+ 70.6%
Hewlett-Packard	817,000	+ 44.1%
Others	4.18M	+ 7.1%
Total	10M	+ 28.6%
Compared with Q2 1998		

possible and not have to put a server in every tiny branch," Nulter said.

But there are thin-client users, of course. At the Bank of Nova Scotia in Toronto, 50 Sun Microsystems Inc. thin clients have been recently installed to access server applications and keep maintenance costs down,

said Gail Smith, senior vice president. A majority of 350 PCs will be replaced with thin clients by year's end.

Several systems managers said they prefer buying a lowcost "fat" client — even if a thin client might do the job because PCs are flexible if end users' needs change.

"We have looked at fat vs. thin clients and have even discussed an in-between 'svelte' client here but have decided we still want a powerful PC, partly as a hedge against an unknown future," said Ron Szoc, senior vice president at Ruesch International Inc. in Washington, an international payments service. "With cheaper prices, what matters is total spending per employee."

Though Framingham, Mass.based researcher International Data Corp. (IDC) reported that 305,000 thin clients were shipped in the first half of this year— an 85% jump over the first half of last year - several industry analysts said thin clients will represent only 2% to 5% of all sales in the next several years of PCs, thin clients, laptops and desktops. The main reason, again, is low PC prices.

"With falling average system

prices, PCs are more like a commodity, and the issue for corporations becomes how quickly and smoothly you can swap out your old PCs," said Charles Smulders, an analyst at Dataquest in San Jose.

Low prices spur more consumer and corporate sales, and several analysts said secondquarter shipments grew more than 20% over the same period last year (see chart).

And preliminary third-quarter numbers show "healthy growth," said Roger Kay, an analyst at IDC. With lower prices, vendors package PCs with services, software and peripheral hardware to keep revenue and profits up.

Rising unit sales don't translate into equal spikes in dollars for vendors, however. IDC projects a 14.3% increase in units of PCs that will ship in 2000 but only a 4.8% increase in PC makers' revenue.

Continued from page 1

Web Carpet

the research firm warned.

In other words, first impressions are critical.

"The impact of the shopping season will go well beyond the \$6 billion, which pales in comparison to the \$78 billion [to be] generated in online sales in 2003. That's really got to be the focus of retailers in this fourth quarter," said Jupiter analyst Ken Cassar. Last year, holiday online shopping totaled \$3.1 billion.

To accommodate this year's millions of Web store newcomers, Lands' End Inc. in Dodgeville, Wis., recently redesigned its highly popular site so that customers are never more than three mouse clicks away from placing an order.

The clothing and household goods retailer also added a feature called Lands' End Live, which immediately connects callers who click for help from a Lands' End customer service representative. In addition to answering questions on the phone, representatives can synchronize their browser to precisely what the customer is seeing.

The same feature, which is built on technology from Communications WebLine Corp. in Burlington, Mass., lets two friends or family members shop together by synchronizing their browsers. When they both click on the shop-with-afriend button and enter the same password, the system connects them.

"What we're seeing is mainstream America coming online. This is a way to take the efficiency of the Internet and humanize it," said Bill Bass, vice president of e-commerce at Lands' End. "So far, the Internet has been convenient but a pretty lonely place for shopping. This turns it into a social shopping experience," Bass

Despite widespread complaints about Web site outages during last year's online holiday rush, site failures haven't permanently alienated shoppers.

But analysts say they believe that's because, until now, online buyers as a group have been more technologically savvy. On the horizon is the great mass of consumers who have little, if any, understandthe shopper's browser to see ing and tolerance of bogged-

down servers or Web sites that display out-of-stock products on their virtual store shelves.

To handle the onslaught, online retailers are turning to outside expertise. Wal-Mart Stores Inc. and eToys Inc., for example, both recently hired Fingerhut Business Service Inc. to fulfill their online orders.

Yet it remains to be seen whether retailers — even with outside help — have prepared well enough for the veritable tsunami of online business about to hit them.

Leading retail sites can expect their average number of daily transactions to nearly quadruple, from 15,000 between January and October to 58,000 during the holiday shopping season, according to Jupiter.

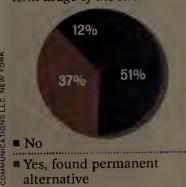
That's one reason analysts are cautioning retailers that haven't already bolstered service capacity, fulfillment capabilities and customer service capabilities to come up with damage-control plans now. For example, they may want to consider giving rebates or coupons to dissatisfied customers whose calls are bound to flood retailers' call centers after the holidays.

These merchants "should think about how to fail gracefully vs. failing catastrophically," said David Schatsky, a Jupiter analyst who specializes in e-commerce infrastructure

As for bolstering Web site capacities now, "it's really too late to implement any major technology changes to support rising volumes" for this holiday season, he said. "The bottom line is: Failures will occur."

Performance Matters

Has a Web site's performance* affected your longterm usage of the site?



- Yes, found temporary alternative
- * Uptime, speed and order fulfillment Base: Survey of 1,210 Web consumers

Periodical postage paid at Framingham, Mass., and other mailing offices. Posted under Canadian International Publication agreement \$0385697. CANADIAN POSTMASTER: Please return undeliverable copy to PO Box 1632, Windsor, ON N9A 7C9. Corputerworld inc. all rights reserved. It is except a single combined issue for the last week in December and the first week in January by Computerworld. Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Copyright 1999 by Computerworld Inc. All rights reserved. It is except a single combined issue for the last week in December and the first week in January by Computerworld is indexed. Back issues, if available, may be purchased from the circulation department. Photocopy rights: permission to ophiciation of the particular of the permission of the particular of t



THE BACK PAGE

FRANK HAYES/FRANKLY SPEAKING

Time for Plan B

2K ISN'T EXACTLY the least of our troubles, but at least one other catastrophe has loomed large for many corporate IT shops lately. Hurricane Floyd turned more than 2 million people in Florida, Georgia and North and South Carolina into refugees two weeks ago. As of last week, another million people in New Jersey still had no drinkable water. And up and down the Eastern seaboard there were floods, power and telephone outages and transportation snafus.

With anything

less than a full-

scale disaster,

IT shops are

pretty poor at

contingency

planning.

Some ugly mess, huh? The good news is, Floyd was so big that IT shops were probably prepared for it. When a hurricane or earthquake or flood hits, we've got insurance, disaster recovery services and emergency generators already online. If a major catastrophe blows away our business-as-usual, we've got Plan B to fall back on.

But when it comes to any problem less than a full-scale disaster — most of the problems we face, in fact — IT shops are pretty poor at contingency planning.

Say a big-deal application falls behind schedule. Some department manager throws a political hissy fit and blocks progress. A vendor's product turns out not to work right, even though your project depends on it.

So what do we do? Half the time, we scramble to find someone to blame. The other half, we ignore the problem, pretending the contingency we haven't planned for doesn't exist — even though that just delays the bigger mess down the line.

No wonder so many IT projects fail. We haven't got a Plan B. The official solution to a slipped schedule or unexpected obstacle is . . . well, just to get back on schedule and on track. Details? We'll cross that flood-swollen river when we come to it.

It doesn't have to be that way. We can do contingency planning — not just for natural disasters and Y2K, but for every project. We know what goes wrong and what we'll have to do to fix it.

The problem isn't what we can do. The problem is political. We don't start out with a Plan B because its existence implies we might not be able to execute Plan A. That's true, of course, but it's politically incorrect to admit it. And if other departments — the ones that want to move dollars from our budget to theirs — catch wind of that admission, we're cooked.

It's also a political mistake to admit that projects face unknowns, products have bugs and people are unpredictable. So we create simple, elegant project plans. And when we go off track, that's unacceptable, too. So we keep claiming we're following the plan — reality be damned — until it's too late.

Sure, we build assumptions into our plans: "Department X delivers Y by date Z." But if they don't deliver, we've got to press on anyway.

So what to do? Simple: Make Plan B a part of every project from the start. And the way to do

that, of course, is to make Plan B part of Plan A.

See, if you build contingency options into your project plan, you can spot and react to problems without departing from the plan. There's no automatic penalty for recognizing an obstacle or failure or schedule slip. You're still on track — even though Plan B has kicked in -- because slipping the plan is part of the plan.

OK, that sounds like a lot of bizarre double-talk. But remember, this isn't a technical problem, it's a political problem. And the important thing is that if contingency options are built in to your project plan, that's the plan everyone has signed off on in the beginning. They've bought into Plan B and now your contingency plan is politically correct.

Will this cruddy up your clean, elegant project plan? Yeah. It'll make the plan messy and ugly and a lot less certain on paper. You'll need plenty of guts (and plenty of support from your CIO)

to propose it after all those years of pretty time lines and straightforward schedules.

But a messy, ugly, uncertain plan on paper sure beats a messy, ugly, uncertain result.

Hayes, Computerworld's staff columnist, has covered IT for 20 years. His e-mail address is frank_hayes@computerworld.com.

SO THE NEW CIO at a Du Laware - oops, Delaware - conglomerate's pharmaceutical division wants to update the ancient e-mail system. Sends around evaluation copies of Lotus Notes. One recipient is a pilot fish. He notices the Close button in the upper right-hand corner is disabled. Asks why. Turns out the CIO kept hitting Close when he meant to hit the Maximize button, so he ordered IT to disable the feature. On every copy. Sort of gives new meaning to those dialog boxes that say, "Do you really want to quit?"

NOT TO BE OUTDONE, the CEO of another very large operation goes to the Microsoft CEO summit at the Gates compound. Cornes back, tells the IT staff he must have one of these Digital Dashboards. In comes the Microsoft SWAT team. They build a prototype in two weeks. The CEO's happy. His IT guys aren't so impressed. They told a pilot fish they could build the same thing much easier with other software - say, Lotus Notes.

COMPU-WHAT? Is it true that the brand new director of product development at that huge mainframe software vendor near Detroit was seen wandering the

halls, poring over her predecessor's papers and asking passersby: "What's this MVS thing I keep reading about?" Enquiring Sharks want to know.

THE GOOD NEWS: An awed pilot fish reports that HP can handle 1.5 million phone calls and 10 million Web hits per month from customers with problems. The bad news: HP gets 1.5 million phone calls and 10 million hits per month from customers with problems.

LAST YEAR, the SIGS Java Conference gave away a grandprize trip to, hyuck hyuck, the island of Java. On the day of the big drawing, a New York Times headline read: "Fears of Sorcerers Spur Killings in Java." There were beheadings involved (now that's a hacker threat). This year, the conference is again giving away a trip - but this time, the winner can choose Java or Bali.

"My boss was beheaded in Java and all I got was this lousy T-shirt." Not bad ... but the Sharky shirt we mail you if your item runs is simple and stylish. So send something salacious: sharky@computerworld .com. And dig the daily dirt at computerworld.com/sharky.

The 5th Wave



On wait—this says, Lunch Ed from Market not 'Lynch', Lunch'.

When Yahoo! Inc. was looking for a Java-based application server to help build their web advertising management system, they could have chosen anyone. They chose Progress Apptivity. Why? Because unlike vendors who just sell technology and head for the exits, we partnered with Yahoo! in order to make the installation and integration as seamless as possible. Our commitment to Yahoo! helped the team get the application up and running in just three months. If this is what you've been looking for, visit us at www.apptivity.progress.com, or call 800-477-6473 ext. 4700.

Performance. Not Promises.

PROGRESS SOFT WARE

